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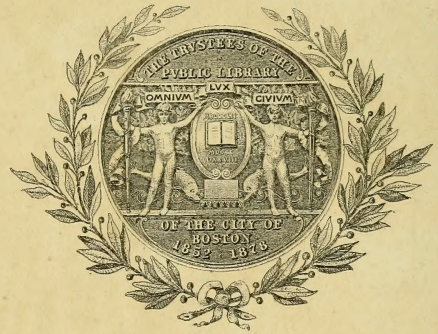

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A TREATISE

ON THE

PRINCIPLES AND PRACTICE

OF

MEDICINE AND PATHOLOGY,

DISEASES OF WOMEN AND CHILDREN, AND MEDICAL SURGERY.

BY

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PREFACE.

In presenting a new work upon the Principles and Practice of Medicine and Pathology, the object is to incorporate the modern investigations into the nature and cause of disease, and the improved methods of treatment by recently-discovered therapeutic agents, into a concise text-book for the student and the profession. In the execution of this labor, the author has endeavored to discard all sectarianism, to investigate impartially the different systems of medicine, and to record the well-attested principles and practice of the entire profession, including the application of all such new agents as have stood the test of a thorough clinical experience. Many of the agents recommended in the management of disease are not found in the regular pharmacopœia, but are fully described by the author in his work upon New School Medicines, as well as by others who have written upon the recent improvements in the materia medica. In the preparation of the work, the author has availed himself, not only of the observations and experience of his predecessors and cotemporaries, but of such additional facts as twenty-five years' extensive practice has enabled him to accumulate.

Philadelphia, *October*, 1866.

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INTRODUCTION.

The first European settlers of this country, not being well supplied with physicians, were induced to resort to various remedies used by the aborigines, for the removal of the many diseases induced. As those remedies were found efficient, many ignorant persons devoted themselves to the cure of disease through their agency.

And notwithstanding this fact, owing to the inefficiency and oftentimes disastrous effects of the Old School Practice, the faith of the people in this efficacy of native remedies, rapidly increased, throughout various sections of the country.

About the year 1810, an attempt was made to establish a botanic system of medicine, by a sagacious individual, but his entire ignorance of general medicine led him to reject many of the most valuable remedies, and to recommend others as universal panaceas, which, in fact, possessed but limited virtues.

Various changes and modifications of the botanic practice were made in subsequent years by medical

gentlemen; yet there was no embodied system, nor was the detached medical knowledge of physicians so arranged and presented by any of the writers, as to constitute a scientific system of medicine.

In 1827 a large infirmary was established in New York, for the purpose of more extensively testing the merits of our indigenous flora in the cure of disease. Vast numbers of patients were treated with marked success, and the subject of establishing schools in which the medical resources of our country might be studied, in addition to the ordinary curriculum pursued in medical colleges, was agitated.

Initiatory steps were soon taken, and a course of lectures given during the winter and spring of 1830, by medical gentlemen of talent.

In addition to the usual teachings of medical colleges, a full knowledge, as far as was known, of the curative powers of indigeneous remedies, together with the medical resources of homœopathy, hydropathy, &c., was taught with a view of appropriating all that science and experience proved to be valuable in the treatment of disease. Here the trammels of antique medicine were sundered, and the first steps taken in the establishment of the New School Practice, which stands pre-eminent in this day. The prosperity of this *New School* was almost unparalleled. The graduates met with great encouragement, and their practice with remarkable success; so much so that other schools were demanded, and were accordingly organized in different sections of the country, by gentlemen of great philosophical power, of indefatigable zeal, energy and perseve-

rance; and a more scientific arrangement was effected of the vast amount of practical medical knowledge previously accumulated. We allude to Drs. Morrow and Buchanan especially; the latter of whom brought much weight and influence to bear in the successful defence of the cause against the attack of a bigoted, sectarian foe. The names of Morrow and Buchanan will ever be held in grateful remembrance, by all true lovers of humanity, as pioneers on this continent, in the cause of medical reform. Long before these gentlemen appeared upon the stage of medical action, however, Dr. Samuel Dickson, had revolutionized the practice of *Old Physic* in Great Britain, which had given birth to a new bantling, and which was christened by Dr. Forbes, editor of one of the leading medical journals, "Young Physic," and gave it his warm support. Hence arose the term "New School," or "Young Physic" in England. But to return to the progress of medicine in the United States. In July, 1851, Dr. Morrow, careworn and exhausted from a life of incessant labor and anxiety for the benefit of mankind, sank beneath the overwhelming pressure of duties which devolved upon him, and yielded up his great soul to the God who gave it. He sleeps beneath the mighty pyramid of benevolence and philanthropy, which, while living, he created, and that will ever stand a vast monument to his greatness.

Soon after this event, Prof. Buchanan retired to private life, to the enjoyment of the quiet associations of the domestic circle.

While these events were transpiring in the west, the

friends of the New School were paving the way for organizing a college in the east; which was consummated in 1860, a faculty appointed, a commodious college building purchased, a museum furnished, and the school placed at once in a flourishing and prosperous condition.

That there is a necessity for a change in the practice of medicine and surgery, might be inferred from the fact, that the present state of society is admitted to be one of great intelligence, and as such, demands a thorough revolution in all those systems which ignorance has originated, and self-interest kept alive.

Many supporters and advocates of the Old School system of medicine, not only assume to be wise, but condemn every thing which is opposed to their prejudices and inherited opinions. And yet this system, in the main, is a thing of the past, a product of the dark ages, and bears upon its face the ancient date of its birth. Its advocates, notwithstanding, assume the prerogative of infallibility, and like the priests of old, are doing all in their power to keep the world in ignorance, and prevent the progress of medicine, and in this they have too well succeeded for the good of mankind.

All other cognate sciences, are presented to an intelligent people in harmony with the progressive spirit of the age, elucidated and explained in a manner calculated to impress the mind with all the facts brought to light by modern researches and discoveries.

The Old School system of medicine, so long stereotyped in fanciful notions, in speculative dogmas, and visionary

theories, instead of courting investigations by teaching its doctrines in plain language, has been wrapped in obscure and unmeaning verbiage, to such a degree, that the most complete and universal ignorance respecting its principles and practice exists among all classes, excepting those who have learned them from the reform or New School literature of the day.

A strange anomaly in the history of these Old School men is, that should one of their graduates, declared by a board of their own examiners, to be thoroughly qualified to practice medicine, add to his medical researches a knowledge of the New School or other system of medicine, and make use of any remedial means not in their pharmacopœia, he is charged with empericism.

Humiliating and disgraceful as this is, these medical bigots of the Old School, actuated by a spirit of intolerance, raise the cry of imposture and quackery, whenever a physician adopts, to the least extent, a system differing from theirs, thus virtually declaring that no physician has a right, absolutely to form an opinion of his own, or at most to adopt it. In the New School college, we review all the doctrines and medical resources of the different systems; and whenever we find a well attested truth, no matter to what department of medicine it belongs, it is at once ingrafted into our practice. Do other systems of medicine do this? Do they understand and teach the specific medical powers and utility of the hundred new and potent remedies introduced by the New School profession? Are their students as impartially taught all other systems?

Their entire ignorance of our remedies and principles of cure, most conclusively show that they are not. New School physicians have discovered, and are using remedies which enable them to cure a large per cent of cancer, hydrophobia, epilepsy, tetanus, scrofula, consumption, &c., all of which are regarded as incurable under other systems of medicine, and justly styled by them, the *opprobrium medicorium*. Besides, the New School cure all diseases, both acute and chronic, in a much less time, and with far more certainty than any other system. No fact is better esta blished than that the New School system of medicine, possesses means to cure dysentery, typhoid fever, pleurisy, pneumonia, inflammatory diseases, &c., generally; and that too, by remedies, which, while they act specifically in removing disease, leave no constitutional injuries. And yet these improvements, calculated to promote the happiness of mankind, are denounced by medical bigots, such has been the history of the world in all ages. Read the history of Abelard, Calvin, Socrates, Descartes, Aristotle, Peter Raums, Columbus, who was treated with cold neglect and repeatedly repulsed; Fulton, who was laughed at; Galileo, who was commanded to renounce his heretical opinions; Harvey, who was compelled to leave his native land, to escape the obloquy that was heaped upon him; Ambrose Pare, who was denounced for introducing the ligature; Lady Mary Wortley Montague, who desired to mitigate the severity of variola, by inoculation, before vaccination was introduced; Dr. Jenner, against whom religion and the Bible, were brought to bear, and his great gift to mortals—vaccination, was regarded as the very anti-Christ.

For further proof that the Old School men have ever stood in the way of the advancement of medicine—their professions to the contrary notwithstanding—let the reader remember, that the act of Mundani, for dissecting two human bodies, was considered heresy; that the introduction of ipecacuanha by the natives of Brazil, was opposed by the profession; that the styptic virtues of matico were demonstrated more than half a century ago, and yet are scarcely used by the Old School: and thus was it with *lobelia*, now considered by them so valuable in asthma, &c., &c. And thus

"A man is thought a knave or fool,
Or bigot, plotting crime,
Who, for the advancement of his kind,
Is wiser than his time.
For him the hemlock shall distil,
For him the axe be bared,
For him the gibbet shall be built
For him the stake prepared.
Him shall the scorn and wrath of man
Pursue with deadly aim."

The present cultivators of medical science are regarded by the advocates of Old Physic as innovators and fanatics; and when, by superior success in the treatment of disease, they demonstrate the superiority of Young Physic over Old Physic, they, like

"A base pack of yelping hounds,
Who wish their betters to annoy,
If a stray cur trangress their bounds,
Will bruise and mangle and destroy."

Notwithstanding this opposition, New School physicians have steadily advanced in favor with the intelligent classes,

while they have instructed the people relative to the destructive system of mercurialization, and other injurious or poisonous agencies of the Old School, till the latter have been compelled to very essentially modify their treatment. Thus, while they refuse to acknowledge our claims, and adopt our improvements, they have been compelled to abandon many of the most destructive features of their practice, as the result of our labors and influence; and we have the most sanguine hope that the time is not far distant when all the evils of their system will be supplanted by the more rational practice of "Young Physic" or the "New School," and thus establish and perfect one grand system of MEDICAL PRACTICE:

"All are but parts of one stupendous whole."

The object of the New School organization is to break the shackles of Hunkerism; to open the science of medicine to all bold and thorough investigators; to enlarge and improve the materia medica; to investigate more fully and clearly the nature and character of disease peculiar to the country and climate, and to place the entire profession upon a more liberal and scientific basis.

And yet with this object and this aim in view, that should be approved by all liberal-minded and enlightened physicians, we have been assailed with terms of insolence and reproach, from those, too, who profess to be conservative,—a conservatism which is characteristic of the profession, and has had a most disastrous influence upon its progress.

The conservative, or Old School man, is always ready to apologize and explain the reasons for his ungenerous course, and with all complaisancy affirms that to talk of improvement, is but a dream or idle fancy; that the fathers of the profession have left us their knowledge as a choice legacy, which we should hold in grateful remembrance; and that the profession has already attained to a position which entitles it to the highest respect.

Yet the positive uncertainty of medicines is manifested in a striking degree, as we trace the history of particular remedies recommended by those who are reverenced as almost divine authority by the conservative. What differences of opinion, what opposite results of like experience, what an array of alleged facts directly at variance with each other; we need only refer to the history of the past and quote from the writings of a few *leading* men in the profession: Prof. Hornor, late of the University of Pennsylvania, in his last Valedictory to his class, "received as a truth the common observation, that progress in knowledge tends to diminish one's confidence, and to increase his humility." And after quoting, approvingly, the reflections of a powerful mind in reference to this observation, Prof. H. adds: "In medicine, this feeling of affright at our insufficiency, advances as we ourselves advance in observation." Prof. Mütter, in an Introductory, a few years before his death, says, " We have in truth

'Rested contented in ideal knowledge.'

"We have received as perfect, theories as idle as day dreams, and the foundations of our art must crumble to the

earth, unless we learn more discretion and better judgment in the selection of the materials of which they are to be constructed."

Prof. Patterson, now no more, in his Introductory, (1851) stated that during his late visit to Great Britain, he requested "one of the leading spirits of the profession in England, to prepare a concise and philosophical treatise on Therapeutics," who, though confessing the want, "promptly declined the task in the following energetic way:" "How in the world can one write a text-book on Therapeutics now? What, in fact, are our Therapeutics at present? All fluctuating, insecure and doubtful! We are plainly in a state of transition, but what we are coming to, I do not clearly see. One thing is certain; and that is, the old explanation of the modus operandi of medicines will no longer answer, and that the professional confidence in drugs is daily growing less: indeed, the confidence in all treatment!"

The foregoing facts disclose a lamentable state of things, but not to be despaired of; much less is it one to be concealed. It is our duty as guardians of the lives and health of our fellow-beings, to unmask, not only the virtues, but the faults of the profession. The course of our subject will now lead us to disclose in what the defects of the allopathic system of practice mainly consist, and the cause and means which seem best calculated to remove them. In order to understand fully why this system of medicine is not more successful in removing disease, it will be necessary to enter very briefly into its historic origin, principles of cure, and therapeutic resources.

Medicine, upon which the Old School system is based by lineal descent, at first consisted of a few external applications with incantations and ceremonies to affect the imagination. Æsculapius arose, and died, and was worshipped as a god in temples consecrated to him. Thus, the practice of medicine at once fell into the hands of the heathen priesthood, who concealed what little knowledge they possessed, relative to disease and medicine. The practice of medicine in the temples, which were built in the midst of the most delightful scenery, was continued until about the commencement of the Christian era. Meanwhile, Pythagoras came upon the medical stage, about 500 years B. C., who rejected all theories in medicine, and contended that experience was the only safe guide to a successful medical practice. These experimental investigations were continued by Hippocrates, who, at the same time, opened an earnest warfare upon the superstitious ceremonies of the Æsculapian priests.

He classified and arranged diseases and remedies in a much more scientific manner than had hitherto existed, and introduced a variety of new remedies, which proved exceedingly valuable in the treatment of disease. But it is almost incredible what little change—what little advancement in the progress of therapeutic means has been made for the last twenty-two centuries, among Old School practitioners, till within the last quarter of a century at least, since when, the chemist and the New School men have forced them to adopt, yearly, many new remedial salts and native remedies, and thus to modify their treat-

ment to a considerable extent, and, the end, benefiting suffering mankind.

And yet the treatment of Hippocrates and that of Prof. Wood of this city, for pleurisy, is strikingly the same; Dr. Wood only superadding the use of cups to abstract additional blood from the patient, when he will not bear a farther loss from a vein in his arm!

Of the theories which prevailed in more ancient times, relative to disease, we will state but this one fact:—Pythagoras, observed that the number of days, which bring about the cure or death of a patient, regulates the crisis of fevers; and the phenomena of disease, as described by him, and his contemporaries verify the aphorism of the New School, That "all diseases are more or less periodic and intermittent."

For many centuries after Hippocrates, we have no writings from which we can learn that any progress in the practical resources of the profession was made. Even after the discovery of the art of printing, in 1424, physicians appeared to be entirely satisfied in translating the writings of ancient authors, and in commenting on what, it would appear, they thought a fixed science.

At length, Paracelsus arose, who, though a most ignorant man, introduced mercury, antimony, and other violent mineral poisons, and, thus became the founder of the present Old School system of medicine, which, in truth, boasts of its antiquity, and as combining all the wisdom of past ages. It is true, that men, eminent in the profession, have labored for a more rational system of practice; have mi-

nutely investigated the cause and nature of disease, and have very materially improved the condition of pathology. But, nevertheless, it must be admitted, that their therapeutic resources are essentially the same, and but a little in advance of those of Hippocrates and Paracelsus.

For, according to all their authors, bleeding, blistering, mercury, antimony, &c., are their principal therapeutic resources. Now, is bleeding the first of these resources of service in the healing art; or, is it productive of more evil than of good? To assist us in the solution of this question, we should inquire, what are the purposes of blood, and what part does it perform in the economy of human life?

Scripture tells us, that "Blood is the life of the flesh." Physiology informs us, that it is the histogenic material, out of which all the organs of the body are formed, and by which they maintain their normal integrity. Pathology still further informs us, that a large majority of all diseases that affect the human family, are dependent upon, or are caused by a deficiency in the whole, or in certain constituents of the blood. How, then, can the removal of blood cure disease? The history of numerous cases of distinguished persons, both in Europe and this country, who have fallen victims to the lancet, conclusively settles this question to any unprejudiced mind. These cases have been so often published, that we deem it unnecessary to repeat them here to the exclusion of other matter. Still more conclusive and pertinent are the cases of pneumonia, reported by Andral: of one hundred cases treated by bloodletting, 27 died; of one hundred, treated by antimony and

mercury, 27 died; and of one hundred, treated by diet and rest, only 7 died! And yet, we are gravely told that venesection is *the* remedy in inflammation! Of what avail was it, in these cases of inflammation of the lungs? Not nearly so successful as diet and rest.

Within our own experience, we have known hundreds, who, while in the bloom of youth, have submitted to be bled, and thus offered up their lives upon the altar of this murderous practice. These are a few of the many facts which lead us to condemn the use of the lancet.

Another therapeutic agent in the Old School materia medica which we reject, is mercury with all its preparations; for ample experience has shown, that the allopathic axiom, that medicines which will produce one train of morbid phenomena will remove an already existing disease, is not successful in combating disease; but, on the contrary, has greatly enlarged the bills of mortality, and increased the amount of human suffering.

It is not true, that two diseases will not manifest themselves in the human organism at the same time, as common observation will show. It is true, however, that while patients are laboring under the specific influence of mercury, they, at the same time, suffer from the ravages of other morbid influences, equally disastrous to the life and health of the patient. Nothing is more common, than to see patients die of idiopathic fevers, syphilis, small-pox, phthisis, pneumonia, pleurisy, inflammation of the brain, stomach, bowels, &c., while under the specific influence of mercury; while statistics show that a much larger portion die, when

thus treated, than when left to the unaided efforts of nature. This fact, was fully appreciated by Lord Byron, who often stated, that, "after a week of half delirium, burning skin, hot headache, horrible sensations, and no sleep, by the blessings of barley water, and refusing to see my physician, I recovered." He, in a subsequent illness, yielded to the importunities of his physician, was copiously bled, and died!

The medical records are very full of horrible details of suffering and death, from the use of mercurial preparations, particularly calomel.

Taylor, Pereira, Sobernheim, Christian, Prof. L. Freeman, Dr. Norris, Surgeon in the Pennsylvania Hospital, Dr. Huston, and many others, cite cases of poisoning from the exhibition of this metallic salt, besides numerous instances of shocking mutilations from extensive ulceration of the soft parts, and necrosis of the bones of the face. One five-grain dose of calomel has repeatedly produced the most serious destruction of the cheeks, throat, &c.

From the testimony of Old School physicians, mercury is capable of producing, and does cause, nearly every disease known; as swelling and inflammation of the glands; rheumatism; palsy; scrofulous rheumatic ophthalmia; syphilitic ophthalmia; dysentery; mucous or bilious diarrhœa, &c., and hence, we presume, they recommend it to cure the same, upon the principle described by Shakspeare:

> "Tut, man! one fire burns out, another's burning;
> One pain is lessened by another's anguish:
> Turn *giddy*, and be helped by *backward turning;*

> One desperate grief cures with another's languish;
> Take thou some new infection to thine eye
> And the rank poison of the old will die."

We have given some of the reasons why we reject the use of mercury and all its preparations in the treatment of disease. We urge the same objections against the medicinal use of copper, antimony, arsenic, lead, zinc, tin; in short, against all minerals not found as a component part of the organic structure of the human body. And if our limits would permit, we could produce an array of facts, proving, beyond a reasonable doubt, that the use of all these mineral substances is absolutely disastrous to health and life. The mineral substances, which are constituents of the human organism, and can be used with benefit in the treatment of disease, are the following:*

Lime, or its base, calcium, is combined with the carbonic or phosphoric acid, in the bones and teeth.

Magnesia, in the sebaceous matter of the skin.

Alumina, in the enamel of the teeth.

Iron in the black pigment of the various parts, and in the blood.

Metallic bases of earth:—calcium, magnesium, silicium, aluminum.

Phosphorus, sulphur, chlorine, and fluorine.

Metals; iron, manganese, titanium.

Water, found universally, composed of hydrogen and oxygen.

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* Wilson's Histology.

Carbonic acid, found in urine, blood, and sweat.

Carbonates, or salts of carbonic acid and a base.

Carbonate of soda, in serum, bile, mucus, sweat, saliva, tears, cartilage, &c.

Carbonate of lime, in cartilage, bone and teeth.

Carbonate of magnesia, in the sebaceous matter of the skin.

Phosphate of soda, in serum, saliva, sweat, bones, muscles, &c.

Phosphate of lime, in bones, teeth, cartilage, and the sandy concretions of the pineal gland.

Phosphate of soda and ammonia, in urine and blood; but probably only for the purpose of being excreted or thrown off as unfit to constitute a part of the animal body.

Phosphate of iron, in blood, gastric juice, and urine.

Chlorine and its compounds:–

Hydrochloric acid, in gastric juice and in the fluid of the cæcum.

Chloride of sodium, in blood, brain, bone, muscle, cartilage, pigment, and gastric juice.

Chloride of potassium, in blood, gastric juice, milk and saliva.

Chloride of ammonium, in sweat and gastric juice.

Chloride of calcium, in gastric juice.

Sulphuric acid and its compounds:—

Sulphate of potassa, in urine, gastric juice, and cartilage.

Sulphate of soda, in sweat, bile, and cartilage.

Sulphate of lime, in bile, hair, and cuticle.

Sulpho-cyanide of potassium, in the saliva.

Fluoride of calcium, in the enamel of the teeth.

Silica and oxide of manganese, in the hair.

Alumina, in the enamel of the teeth.

Oxide of iron, in blood, black pigment, lens and hair.

Oxide of titanium, in the capsulæ renales.

The above minerals and their compounds, being constituents of the animal organism, necessarily play an important part in the great drama of organic life; and disease of any of the tissues may, and frequently does occur, from a deficiency of some of the elements of the parts. The blood may become diseased from a deficiency of iron, sodium, or potassium: in this case a proper administration of these articles may be beneficial. A lack of sulphur and soda in the system may cause a deficiency of bile; in which case a supply of them may restore the liver to its normal condition, and the bile to its natural quantity. Thus, while all minerals, which constitute a part of the organic structure, not only become assimilated and assist in restoring the abnormal conditions of the system to a healthy state, all minerals which do not enter into the organization of any of the various tissues, when introduced into the system, act as foreign agents, and prove a constant source of irritation, disease and death. Having hinted at what we conceive to be some of the facts relative to the past and present conditions of Medicine, we now proceed more directly to consider some of the principles which guide the great New School movement for the reform of the medical profession.

1st. A determined effort to ascertain more precisely than has been done hitherto the natural cause and effects of dis-

cases. Or, in other words, the fatality of disease when left to the unaided efforts of nature.

2nd. A determination to understand more fully the *modus operandi* of medicines, and to ascertain their real curative powers.

3rd. To continue our researches in the vegetable, mineral and animal kingdoms for the purpose of developing resources for the removal of disease.

4th. To introduce into the profession a spirit of liberality and progression; to dispense with all creeds and cliques, and to overcome all party prejudice among the different members of the profession.

5th. That it is the duty of every physician to investigate each system of medicine, and make its valuable resources available for the relief of the sick.

6th. That both science and experience have demonstrated that the use of mercury, lead, zinc, arsenic, and the entire catalogue of minerals, incompatible with the organic tissues, is a fruitful source of disease, and dangerous to life.

7th. That blood-letting is one of those dangerous practices which experience has found to be positively injurious in all cases.

8th. That the pharmaceutical method of compounding a great variety of medicines into syrups, powders, pills, &c., not only prevents the physician from ascertaining their real curative powers, but the action of each is frequently neutralized, and the object defeated for which it was given.

9th. That it is far better to leave the disease to the unaided efforts of nature, than attempt to remove it with

medicine, unless its indications are demonstrated by observation and science.

10th. That investigation and research into the nature and cause of disease should be encouraged, and all new facts relative to medical science should receive due attention.

11th. That neither Allopathy, Homœopathy, nor Hydropathy, as an exclusive system of medicine, has arrived at any considerable degree of perfection, as shown by the fact that neither very materially lessens the natural fatality of disease; although, occasionally, each of these may prove successful, as shown by the power of cold water to allay inflammation, which is Hydropathy; by nitrate of silver for aphthæ of the mouth, which is Allopathy; or by rhubarb for diarrhœa, which is Homœopathy. Each of these systems of medication being occasionally applicable in removing disease, they should be understood by the physician, and adopted as indicated.

12th. To discourage, by every honorable means, the baneful practice of constant drugging for all trifling diseases.

13th. To investigate and adopt the physiological and hygienic methods of curing and preventing disease by a proper regulation of the diet, temperature and purity of the air, by bathing, friction, proper clothing, occupation, mental and physical training, &c.

14th. That the practice of physicians, of spending their time in idle conversation, electioneering, and otherwise, in pursuits foreign to the profession, disqualifies them for practice; and that, to be a skilful physician, the whole energies of body and mind should be devoted to the profession.

15th. To avoid adopting any set of dogmas in medicine as infallible; bearing in mind, that a constant change of opinion relative to the fundamental practical principles of the art, shows that what men supposed to be true at one time, have been proved to be entirely erroneous at another, and that the only means of advancing medicine to the rank of an exact science, is by constant rejection of old errors and the reception of new and well-attested truths.

16th. To combine the two extremes of the profession—the ultra-conservative and the fanatical reformer. As conservatives, we would pay due respect to the labors and discoveries of our predecessors in the profession, and adhere with commendable zeal and dignity to those doctrines which long usage, and extensive experience and science have demonstrated to be true. As reformers, we would extend our researches in every direction which promises accession to the already existing stock of medical knowledge, paying no homage to the aristocracy and learned pedantry of the profession, only so far as it has contributed to the advancement of science. Finally, that we adopt and adhere to the facts of the conservative, and enter into the labors of the reformer with equal cordiality, under the name of New School.

17th. To use every practical means to inform the public upon the subject of medicine in all its departments, that they may understand the true merits of the different systems of medicine, and be prevented from trusting their lives and health in the hands of men ignorant of the principles and practice of the profession.

18th. To cultivate the spirit of true catholicism, liberality and progression; and to show the positive necessity that every physician or student of medicine, who would acquit himself with honor and with fidelity to his practice, should not only pass through the ordinary and preliminary course of study, but that his whole time and attention should be devoted to the investigation of all the therapeutic resources of every school of the profession, selecting from each that which science and experience have proved beneficial in the treatment of disease.

It will be seen from the foregoing, that the principles laid down as the basis of the New School, cover every department of the science. That they propose to annihilate the boundaries of party limits; to break the shackles which bind the conservative to his dogma; to reinvestigate existing systems of medicine, and study anew all the laws of life and health; to ascertain to what extent health may be promoted and disease prevented. This is the work which has been commenced by American Medical Reformers, and to the completion of which, they will consecrate their future labors. They desire to establish a practice based upon scientific principles and inductive experience. They claim that, as a man is composed of the common elements of matter, that to understand his organism in its physiological, pathological and therapeutical relations, is to understand his material structure and forms, with their various movements and forces, and cause of forces, which necessarily includes an intimate knowledge of the great branches of Physical Science, vegetable, animal and mineral,

with all the laws and forces which control them, as electrical, magnetical, chemical, dynamical, and physiological or organical. The fallacies of all former doctrines in medicine have, in a great measure, arisen from a want of this important knowledge. The allopathist, in establishing his system of medication, that all diseases are cured by medicines which alter or change the structure or physiological forces of diseased parts, entirely omitted the chemical, organic and vital dependencies of matter, as the very disease which he intends to remove, by altering the organic tissue, may depend upon deficiency of carbon, nitrogen, hydrogen or oxygen. As these substances alone possess the power of combining and forming the basis of all the elementary tissues, a deficiency of either of these elements may give rise to a series of pathological changes that no allopathic alterative could overcome, the only remedy being to introduce into the diseased organism its original elements.

Suppose the gastric fluid to be imperfect, as it frequently is, owing to a deficiency of oxygen to unite with the chyle and blood, out of which it is formed;—any attempt to reestablish the normal quantity by alteratives would prove as effectual as an attempt to reorganize water, after the oxygen is set free, by adding alteratives. A deficiency of the carbonates may cause a disease of the liver, lungs, cartilage, bones or muscles. It is a fact that carbon, united with soda, constitutes a large portion of bile; that, combined with lime, it forms one of the elements of the teeth, bone, &c.; that it unites with oxygen in the lungs to maintain animal temperature. Let us inquire, of the allopathist,

how many doses of mercury, how much alterative influence, from bleeding and blistering, will compensate for this deficiency. It must be borne in mind that the human system is an extensive organic chemical laboratory, in which is manufactured germ-cells, epithelium, mucus, muscle, nerves, brain, gastric juice, saliva, chyme, chyle, blood, lymph, tears, hair, nails, cuticle, cartilage, bone, &c. The object of this extensive manufactory is to furnish material for the constant demand made by the human body, that it may maintain its integrity and perpetuity. This constant demand arises from the fact, that not only all the inorganic, but the organic elements, which come in contact with the human organism, tend to unite with it and form new compounds, structures and forces, thereby disturbing the natural relations and dependencies of the human organism upon its organic elements, causing disintegration and destruction of the old tissue, which is supplied by these newly-manufactured products. Any excess or deficiency in the supply is disease. And the only philosophical method of curing or removing such abnormal conditions is to supply elementary deficiencies, prevent excesses, and maintain the natural relation of elementary principles to the human organism. What is true of Allopathy is equally true of Homœopathy. Who, after a moment's reflection, would suppose that chlorosis, which every pathologist admits is dependent upon a deficiency of iron in the blood, could be removed by infinitesimal doses of charcoal, oyster-shell, mercury and arsenic. Or who would suppose that the same remedies would remove disease of the bones, caused

by a deficiency of lime and carbon in the system. But, what is still more ridiculous and absurd, in this hair-brain theory of Hahnemann and his followers, is, that their remedies, as mercury, arsenic, belladonna, &c., are capable of causing, and consequently of curing, fifty or sixty diseases each. Jahr, in his Manual of Homœopathy, vol. i., p. 563, states that sulphur will both cause and cure the feeling of despair of eternal salvation. Lachesis (p. 210, Jahr's Manual) produces, and hence should cure absence of religious feeling and fear of approaching death: a small dose of gold, taken internally, produces excessive scruples of conscience, and despair of one's self and others; veratrum produces extraordinary taciturnity, with oaths on the slightest provocation, and raving about religious matters. Aconite (p. 3) produces an irresistible desire to blaspheme and swear, and a sensation as if the mind were separated from the body. Anacardium (p. 33) produces the same swearing symptoms and absence of all moral and religious feelings, (vol. ii., p. 155;) a dose of common colocynth (an ingredient in allopathic pills which most people have repeatedly swallowed) produces, (says Jahr, p. 189,) want of all religious feeling, &c., &c., &c. Lycopodium (club-moss) possesses the same power, (p. 319,) as sulphur, *i. e.* the feeling of despair of eternal salvation. Pulsatilla causes, and will cure, despair of eternal happiness, with continued prayer and devout aspects: Jahr, (p. 468.)

Thus, while Homœopathy is equally unphilosophical and more nonsensical in its general principles, it has advanced some of the most extravagant notions relative to the action

of medicine ever advocated by any sect in the profession since the magic incantations of the followers of Æsculapius. If it were true that these remedies would produce such terrible conditions of the body and mind, the effects would be still more disastrous.

In this case, a patient, who was curing himself for itch with sulphur, would be seized with despair of eternal salvation; also, according to Pulte's Homœopathic Domestic Practice, p. 516, he would contract periodical and intermittent head-ache; obstruction of the ears, with humming and redness; inflammation and ulceration of the nose; profuse perspiration day and night; congestion of blood in the head; heat in the face; tooth-ache; sore mouth; dislike for sweets; pain in the abdomen; constipation and piles. We can readily conceive how a person, who was suffering under the influence of the above disease, would be willing to endure many inconveniences to obtain relief, but, that he would exchange it for such a catalogue of ills is quite doubtful; and yet, if the homœopathic doctrine be true, and their notions of the action of remedies correct, such would be the case; and while one morbid condition of the human organism was being corrected, several hundred others would make their appearance. It is frequently claimed, by the disciples of this system, that although the law of *similia similibus curantur* cannot be established by appeal to the philosophy of medicine, still experience teaches it to be true in practice, and they have observed cases to recover while under its influence. This may be true, and yet it may not follow that the medication contri-

buted in the least to the result; as it is now a well attested fact that, without medical interference, the average mortality of all disease in this country does not exceed seven per cent. Hence, to ascertain the usefulness of any system of medicine, it is necessary not only to observe that some recover, but also how many the profession loses; if above seven per cent., it may be inferred that medication increases the mortality of disease. The limits of this work will not permit me to enter into a full investigation of these different systems of medicine, and show what I conceive to be true, relative to all their principles. But, in accordance with the principles of the New School theory, while we would reject every hypothesis not founded upon science, we would gladly adopt whatever Homœopathy, Hydropathy, or Allopathy contributes to the real advancement of medicine.

The therapeutic principles which guide us, then, are neither exclusively Homœopathic, Allopathic, Hydropathic, Antipathic, Physiological, nor Hygienic; but, by an intimate knowledge of the laws of life and organic elements of the different tissues, with a correct view of all the causes and influences brought to bear upon the human organism, together with a knowledge of all the physiological and pathological changes connected with disease, we are enabled to adopt such principles of cure as the nature of the case may indicate. In the choice of our remedial agents, we claim equal independence and liberality, selecting from all systems such as science and enlightened experience prove to be beneficial to the afflicted, having formed no definite

boundary to our researches; for, as yet, no theory of medicine, as an independent system, has been able to stand the test of scientific analysis and experience. The following remarks of Thomas Jefferson, in a letter to Dr. Worcester, are to this point. He says:—"I have lived, myself, to see the disciples of Boerhaave, Cullen, Stahl, and Brown, succeed each other like the shifting figures of the magic lantern," and the practice predicated thereon, of course, as evanescent and as changing as its sister theory; and we, of the present time, have, most of us, witnessed one entire revolution in theory and practice; while we are, at this very moment, on the last quarter of the full-moon glory of a fast fading system. Where is the practitioner so wedded to the past, so tenacious of early practice, and so uncompromising of change, as to risk his reputation or the lives of his patients, on the practice of twenty years ago? It is more than probable that before another half century has passed, the present system of Hydropathy, Homœopathy, and Allopathy, like those of Hoffman, Boerhaave, Cullen, Stahl, and Brown, will be remembered only as a relic of the past. The well-attested truths of each will, no doubt, be treasured up by the American democratic or New School cultivator of medical science, to contribute to that perfection in medicine which will enable it to take rank with Chemistry, Geology, or Mathematics. To accomplish this, is the object of the New School practitioner.

SECTION I.

DIAGNOSIS.

In studying disease, it is evident that attention to one symptom only, cannot lead to truth, since the cause of its production may be various; and it is often necessary to distinguish between symptoms uniformly associated with certain conditions, and those which are merely accidental; hence it is manifest how much correct diagnosis must depend on a knowledge of the true nature and history of disease.

While thus studying diagnosis, it should not be forgotten, that, though our first aim be to arrive at a correct conclusion regarding the disease under which the patient is laboring, our ultimate object is to restore health. Therefore, whilst combining symptoms in our mind to give unity to the whole, we must ever have regard to any thing they may teach us concerning the condition of the patient.

Thus, for example, in a case of that state to which the much abused term of inflammation is applied to any viscus, we should not act upon this knowledge alone, and pursue but one course for its subjugation, as old physic does, but we should consider the signs of strength or weakness, of increased or depressed vitality, which accompany it. This oversight of the general condition of the patient, is probably the most prolific source of many a hasty and ill-formed assumption, based on insufficient grounds.

Faith in treatment then becomes shaken, because a false opinion, once formed, remedies cannot be employed in a manner conducive to the recovery of the patient. Hence the importance of correct diagnostication. To arrive at this, we must, in every case, inquire

into the general state of the patient at the time of observation, which very properly comes under four groups of symptoms: 1. General phenomena, as pertaining to,—

a. Temperature and dryness of the skin;

b. Fulness and quickness of the pulse, or its opposite;

c. Appearance of the tongue, the state of the secretions;

d. State of the bowels and kidneys.

e. Desire for food and drink.

2. The general appearance of the patient—

a. Size—emaciation, or increase, general or local;

b. Aspect of face, and expression;

c. Changes of color of skin, general and local.

3. His position, or posture:—

a. In bed; the manner of lying—on the back, or either side; quiet, restless, &c.

b. Out of bed; posture, gait, stiffness or loss of power of limbs, &c.

4. The sensations of the patient.

The indications of a general condition of the system derived from these several sources, form a comparison of the symptoms exhibited by the skin, pulse, tongue, bowels, thirst and appetite are important as a whole.

In reference to the action of the heart, it is well to observe, that the age of the person has an important influence over the frequency of the pulse; sex and habit, over its fulness and firmness.

The state of the tongue is always to be noted, for no organ more quickly indicates derangement, however slight, or foreshadows the probable event of the disease from day to day.

A knowledge of the condition of the bowels is also necessary, next in order, to qualify the observations made upon the condition of the tongue; and the quantity of urine has a similar relation to the existence of thirst.

Aspect and expression are to be studied in their relation to the physiognomy of disease, of which they are most important elements. The former points to physical conditions; the latter to sensations of the patient; and are both of much value. To the intelligent, observing physician, they are as a mirror of the *better* or *worse* condition of the patient.

Position in bed is to be considered with reference to its being horizontal, or more or less erect; a sign having reference chiefly to the state of the respiration, or to sensations of pain, which are aggravated by one position and relieved by another.

A few of the indications referred to above, are here examined.

The skin is remarkably moist and soft in delirium tremens; the perspirations are generally profuse and sour in acute rheumatism; colliquative sweats are constant attendants on the latter stages of phthisis and on profuse suppuration; the crackling feeling of emphysema and the pitting under pressure of œdema, are each very characteristic.

The pulse is hard and wiry in abdominal inflammations; its frequency is remarkable in acute hydrocephalus; slow and labored in cerebral disease; irregular in disease of the heart; almost imperceptible in cholera, &c.

The tongue covered with a thin white layer, is indicative of slight gastric disorder; when *patchy*, of considerable irritation; yellow color, bilious; shining, glazed and chapped of long continued inflammation or ulceration of the bowels; aphthæ, &c., indicate imperfect nutrition, &c.

The character of the stools, resemble rice-water in cholera; are clay-colored in deficiency of bile; and are yeast-looking when fermentation takes the place of digestion.

The character of the urine is very limpid and abundant in hysteria; dark-colored in febrile states; and an acid sediment in rheumatism.

The *aspect* is often very significant; the thickened alæ of the nose and upper lip, of scrofula; the waxy pallor, of chlorosis; the sallow hue, of malignant diseases; the blue color of the lips of heart disease; the dusky flush, of pneumonia; the hectic flush, of phthisis; and the bloated blotchy face of the man of irregular habits of living.

The *expression* is anxious in disease of the heart and dyspnœa; it is pinched and contracted when there is much suffering, and in low forms of fever; the skin is remarkably white in anæmia; yellow in jaundice, and in some cases of malignancy; muddy hue, in disease of the spleen; blue in Asiatic cholera, and livid, in commencing gangrene.

The patient's position in bed; his head is elevated in disease of the heart; in great debility, he lies on his back; in peritonitis, the knees are, in addition, drawn up; in cramps or pain of the abdomen, he lies on his side. There is constant movement in chorea; and a tremulousness in delirium tremens.

THE AUSCULTATORY PHENOMENA OF THE HEART IN HEALTH AND DISEASE.

Dyspnœa and palpitation are the chief subjects of complaint with patients, suffering from disturbance of the circulation, and these symptoms are present in functional as well as in organic disease of the heart. The history of the case and abnormal sounds of the heart or deviations from the normal conditions, can alone throw true light upon each individual case. In the first place, the student or physician must be familiar with the position and average force of the impulse of the heart; with the usual extent of dulness on percussion, when it is of normal size; and with the sounds, which accompany its systole and dyastole in a state of health; otherwise he will not be able to appreciate them when abnormal.

Disease of the heart and its investing membrane, give rise to a *friction* sound and certain endo-cardial murmurs; the former being external and the latter internal in relation to the heart.

The friction, or rubbing, or to and fro sound, is indicative of pericarditis, or inflammation of the sac which contains the heart, and without its presence, we should oftentimes not know of the existence of the inflammation at all.

When either sound of the heart is prolonged, or loses its usual distinctness, the essential element in its production is an altered relation of the blood to the solid structures, whether by change in the one or the other; and they are only heard when the blood is in motion, out of or in the ventricles. The character of these sounds, as caught by the ear, is more or less *blowing*; the murmur, or *bruit*, as it is termed, being soft, rough, grating or musical in proportion as the soft parts are altered, constricted, &c.

When the murmur is systolic, that is, when nearly coincident with the impulse of the heart against the chest, it must be either due to alterations in the orifices through which the blood passes, or to changes in the character of the blood itself, or to a combination of

both. But if the *bruit* be recognised to be diastolic, it may be decided at once that there is valvular imperfection, which, in a majority of cases, is seated in the aortic valves, by which blood is allowed to return into the left ventricle; if the diastolic murmur be heard from the apex towards the centre of the heart, it indicates very decided mitral disease; if from the base towards the centre, imperfect closure of the aortic valves. When the systolic murmur is heard towards the apex, a weak pulse confirms the diagnosis of mitral disease; while a jerking, thrilling pulse, in cases of systolic murmur at the base, increases the probability of aortic disease.

Disease in the mitral valves may be traced, in a large number of cases, to rheumatic fever: hence, the general aspect of the patient, the history of the case, and the various murmurs must be carefully noted, the mind must be trained to examine and weigh the facts of each case—the ear must be accustomed to discriminate and individualize the sounds, and then the physician will seldom fall into error.

Dropsy.—Local accumulations of fluids are as numerous as the serous sacs which are found in all the great cavities of the body. Anasarca is very frequently associated with disease of the heart, or of the kidney, lungs, or liver, and these organs must be carefully examined in all such cases.

If the dropsy be *acute*, that is, comes on suddenly, it generally arises from exposure to cold, and is very common as a sequel of scarlatina.

Chronic dropsy is that which more usually attends upon cardiac, renal, pulmonary, or hepatic disease. We also often find œdema of the feet and ankles depending upon deterioration of the blood, with excess of serum, in exhausting diseases—such as phthisis, cancer, hæmorrhages, &c.

The presence or the absence of fluid, in ascites, is learned from the existence of fluctuation—of a wave-like movement through the fluid, across the abdomen, when a blow is struck at a distance, by one hand opposite to that of another. An accurate determination of fluid can be arrived at, by changing the position of the patient, by dulness on percussion, the absence of resonance, and fluctuation or wave-like movement observed throughout the abdomen.

Hemorrhage.—Epistaxis.—In young persons, bleeding from the

nose is no necessary indication of disease; though sometimes this form of bleeding indicates the existence of the hæmorrhagic diathesis. It accompanies poverty of the blood, hypertrophy of the heart; and as a consequence of local disease, it most commonly arises from polypoid or fungoid growths in the nose.

Hæmoptysis.—The appearance of blood in the sputa may or may not indicate a diseased condition of the vital organs, as the heart or lungs. It is of frequent occurrence in hysterical females; as a consequence of a relaxed or aphthous state of the tonsils, or sponginess of the gums. In such cases, inspection of the fauces, and of the blood, will satisfy the physician that it is not bronchial or pulmonic. When its source is from the latter, we have the evidence of existing cough, accompanied by expectoration clearly coming from the lungs, with which florid blood is clearly intermixed; as is the case in phthisis, disease of the heart, aneurism, &c.

Hæmatemesis.—The blood in hæmetemesis is mainly derived from three sources; (1) from erosion of a vessel, in consequence of ulceration, for instance; (2) by exudation from the surface of the mucous membrane, as in diseases of the liver, amenorrhœa, vicarious menstruation, &c.; by oozing from a diseased portion of the stomach in cancerous formations, as a certain admixture of blood with the contents of the stomach in persistent vomiting is an early and only too certain indication of commencing scirrhus; ceasing for a time and re-appearing as ulceration proceeds.

Hæmaturia.—The presence of blood must not be assumed from its color; for some vegetable matters give to the urine a pink, or bright red hue; in some disorders, deposits of a red color closely resemble it; and an admixture of bile sometimes produces an appearance very similar to that caused by dark and altered blood, As a ready test, it will be observed that, when blood is present, the urine is not only changed in color, but has lost its natural transparency, and this opacity is increased by heat and nitric acid. The source from which blood comes, may be any part of the urinary apparatus, and may proceed from some abrasion of surface, caused by calculus, or ulceration, or other injury; or it may be the result of fungous growth. When the quantity is small in amount, and of a pink, brown, or smoke color, it is generally a symptom of chronic disease of the kidney.

Other Methods of Diagnosis—The methods resorted to for estimating the condition of the various organs and tissues of the body, are—Inspection, which comprises a complete examination of all portions of the body. On inspecting the chest, observations should be made as to its configuration; whether it be deformed or natural. The moions of the chest should also be examined, as a forced inspiration indicates spasmodic asthma; and a partial inability, pleurisy, &c. *Palpation.*—By palpation is understood the application of the hand, or tips of the finger to the various portions of the body, so as to ascertain whether there is fluctuation, diminished or increased sensibility, &c. Mensuration. This consists of various measurements of different parts of the body, in order to learn the alterations, motions, size, &c. Percussion. The sounds produced by percussion, according to Mr. Bennett, are those occasioned in the solid textures of the organ percussed. The different density and elasticity of these textures will, of course, more or less modify the number and condition of the vibrations, and give rise to different sounds.

M. Piorry considers that nine elementary sounds are thus formed; which he has designated from the organ or part which originates them, "*Femoral, jecoral, cardial, pulmonal, stomachal, osteal, humorique*, and *hydatique*." These sounds may be reduced to three elementary ones; that, in point of fact, there are only three tones occasioned by percussion, and that all the others are intermediate. These three tones are, respectively, dependent—on the organ's containing air; on its containing fluid; and on its being formed of a dense, uniform, parenchymatous tissue throughout. They, therefore, may be termed the *tympanitic*, the *humoral*, and the *parenchymatous*. Percussion over the empty stomach gives the best example of the first kind of sound; over the distended bladder, of the second; and over the liver, of the third. Certain modifications of these sounds occasion the *metallic* and *cracked-pot* sound. The latter is made audible over the chest under a variety of circumstances, by percussing with the mouth open. The terms jecoral, cardial, pulmonal, intestinal, and stomachal, however, may be used to express those modifications of sound produced in percussing respectively the liver, heart, lungs, intestines, and stomach.

No description will suffice to convey proper ideas of the various

alterations of tone occasioned by percussing over the different thoracic and abdominal viscera. To become acquainted with these, it is absolutely necessary to apply the pleximeter to the body, and then half an hour's practice with this instrument and the hammer will be sufficient to render any one conversant with those sounds which may be heard in a normal state.

It must be remembered, however, that the tones, even then, may vary according to circumstances. Thus, after a deep inspiration, the pulmonal sound will be rendered more tympanitic, aud after expiration, more parenchymatous. In the same manner the stomach and intestines may give out different sounds, according to the nature of their contents. In the left or right iliac fossa a clear tympanitic sound will be heard when the intestine below is empty; and a dull, parenchymatous one, when full of fæces.

A study of the different modifications of sound, which various organs thus produce in a state of health, readily leads to the comprehension of those which may be elicited in a morbid state. Thus, the lungs may occasion a dull or parenchymatous sound, from solidification, the result of exudation; or, on the other hand, become more tympanitic, from the presence of emphysema. The abdomen may give out a parenchymatous sound, from enlargement of the uterus, or an ovarian tumour; or a dull, humoral sound, from the effusion of fluid into the cavity of the peritoneum.

Of the Sense of Resistance produced by Percussion.—By the sense of resistance is understood the peculiar sensation resulting from those impressions which are communicated to the fingers on striking hard, soft, or elastic bodies. It is of the greatest service in determining the physical condition of the organ percussed. The sense of resistance bears relation to the density of the object struck; hence firm and solid textures offer more resistance than those which are soft or elastic. The thorax of the child is elastic, whilst that of the adult is unyielding. Of all the thoracic and abdominal organs, the liver presents the greatest degree of resistance, and the stomach the least. The presence of fluid in the hollow viscera offers an amount of resistance between the parenchymatous organs on the one hand, and those containing air on the other. But air much condensed, or fluid contained within the rigid walls of the thorax, may offer a considerable degree of resistance.

The sense of resistance should be as much educated by the physician as that of hearing; and it would be difficult for an individual, practised in the art of percussion, to say which of these two points is the most valuable. Both are only to be learned by practice; and we consider it perfectly useless to describe in words, what may be learned in half an hour by the use of the pleximeter and hammer on a dead body, or the living subject.

In order to more fully comprehend the location of the various organs so essential to a complete understanding of the proper method of percussion, we refer to figs. 1 and 2, which represent the normal extent of dulness. Notice, on percussing a healthy individual, fig. 1 represents the anterior, and fig. 2 the posterior positions; P P, pulmonary sound; C, cardial sound; H, hepatic sound; S

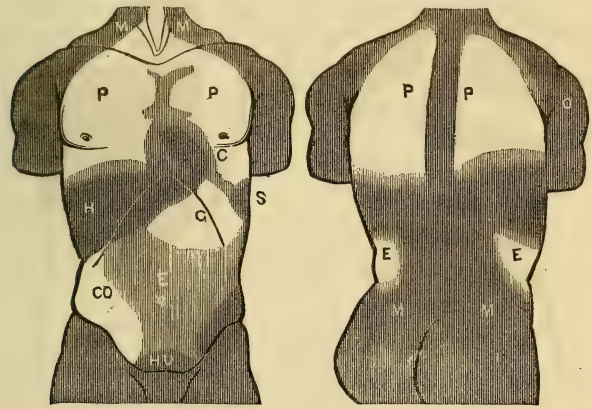


Fig. 1. Fig. 2.

splenic sound; G, gastric sound; E, enteric sound; Co, colic from distended colon; Hu, humoral sound over the distended bladder; M, muscular, and O, osteal sounds.—(*Piorry.*)

On percussing the lung, especial reference should be had to detecting the healthy from the unhealthy, by comparing the opposite sides of the chest, and the various sections of the same lung. In the healthy lung, a marked difference in the resonance is observed from that in which the lung is diseased. Congestion of the lungs, in the first

stage, causes only slight dulness. In the last stage, where the congestion is extensive, the dulness is almost complete; and in partial indurations of the lungs from apoplexy, or cancerous exudations, the dulness heard will be circumscribed, and always correspond to the extent of the diseased portion. Cavities in the lungs, when filled with air, may be detected by the excessive resonance, or tympanic sound. Cavities may be filled; in which event they will yield a dulness on percussion. On percussing the lungs, it is well to change the posture of the patient; as, in case the dulness is dependent upon a fluid effused into the pleural sac, the area or extent of dulness will change with the posture of the patient. When the lung is emphyse-

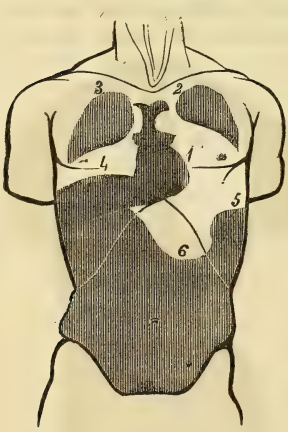


Fig. 3.

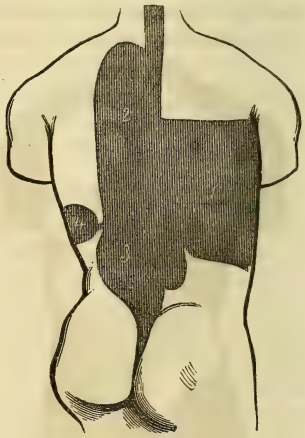


Fig. 4.

matous, or if air be present in the pleura, the sound elicited will be tympanitic. Tympanitis, however, may be heard in other conditions of the lungs; such as their over-distention with air, as in some cases of pleuro-pneumonia.

Fig. 3 represents phthisis, atrophied heart and liver. 1, atrophied heart; 2, infiltrated tubercles on the left side; 3, the same on the right side, with the cavity; 4, atrophied liver; 5, spleen; 6, unusual dulness over the abdomen from prolonged abstinence.—*Piorry.*

Fig. 4 represents pleurisy. 1, on the right side, when in the

erect position; 2, on the left side, when lying on the right; 3, kidneys; 4, spleen.—*Piorry.*

1. Auscultation may be practised directly by applying the ear to the part, or indirectly through the medium of a stethoscope. Generally speaking, direct auscultation answers every necessary purpose, except when the surface is unequal, or when it is desirable to limit the sounds to a small region, as during auscultation of the heart. In either of these cases, a stethoscope is necessary. The instrument is also useful to confirm or nullify the existence of certain fine sounds, which may be detected by the naked ear; to remove the head of the practitioner a respectable distance from the bodies of persons not distinguished for cleanliness; and lastly, as the most delicate method of auscultating the chest anteriorly in women. The stethoscope should be used merely as a means to an end—that end being the right appreciation of the pathological changes indicated by certain sounds.

2. In the choice of a stethoscope, you should observe, 1st, that the ear-piece fits your own ear; 2d, that the trumpet-shaped extremity is not above an inch and a half in diameter, and is rounded so as not to injure the patient's skin when pressure is made upon it; 3d, that it is light and portable. The instruments recently made of gutta percha fulfil all these conditions.

3. In applying the ear, the body of the patient should be covered only with a smooth piece of linen, or a towel. But the stethoscope should be applied to the naked skin, and held steadily above the trumpet-shaped extremity by the thumb and index finger. It should be pressed down with tolerable firmness, while with the second, third, and fourth fingers, you ascertain whether the circular edge be perfectly applied, which is absolutely essential.

4. The position of the patient will vary, according to the part examined. In auscultating the lungs anteriorly, the erect or recumbent position may be chosen, the two arms being placed in a symmetrical position by the side. If the chest be examined posteriorly, the individual should lean somewhat forward, and cross the arms in front. In auscultation of the abdomen, various positions will be required, according as the anterior, lateral, or posterior regions demand investigation. The practitioner, also, should choose such a position as will prevent too much stooping or straining.

5. Whenever individuals are thrown into such a state of agitation as to interfere with the action of the heart or lungs, the examination should be deferred until their fear diminishes, or the greatest caution should be exercised in drawing conclusions. Non-attention to this rule has led to many errors.

6. Before examining patients it is necessary that you should have made yourselves perfectly acquainted with the sounds which are continually going on in the healthy body. Omission of this rule not only renders the examination of patients useless, but betrays great want of consideration; for, as it is only from the alterations the healthy sounds undergo, or from their being replaced by others, that we draw conclusions, how can this be accomplished if we are ignorant of their character in the first instance? It is expected, therefore, of every physician, that he be familiar with the character and theory of the various sounds heard in the healthy body before coming to the bed-side."—*Bennett.*

Special Rules to be Followed during Auscultation of the Pulmonary Organs.

1. In listening to the sounds produced by the action of the lungs, we should pay attention to three things:—1st, the natural respiration; 2d, the forced, or exaggerated respiration; and 3d, the vocal resonance. For this purpose, having listened to the sounds during ordinary breathing, we direct the patient to take a deep breath; and then, still listening, we ask him a question, and during his reply judge of the vocal resonance.

2. We should commence the examination immediately under the centre of one clavicle; and having ascertained the nature of the sounds and vocal resonance there, we should immediately listen at exactly the corresponding spot on the opposite side. The examination should be continued alternately from one side to the other, in corresponding places, until the whole anterior surface of the chest be explored. The posterior surface is then to be examined in like manner.

3. When, in the course of the examination, anything different from the normal condition be discovered at a particular place, that place and the parts adjacent should be made the subject of special examination, until all the facts regarding the lesion be ascertained.

4. It is occasionally useful to tell the patient to cough, in which case we are enabled to judge,—1st, of forced inspiration, as it precedes the cough; and 2d, of the resonance which the cough itself occasions.

The Sounds produced by the Pulmonary Organs in Health and in Disease.

It is important to impress upon your mind that the sounds which may be heard in the lungs are like nothing but themselves. Physicians are too apt to take erroneous notions from reading on this subject; and, instead of listening to the sound actually produced, fatigue themselves in a vain endeavor to hear something like the crackling of salt, the rubbing of hair, foaming of beer, or other noises to which these sounds have been likened. Preconceived notions frequently oppose themselves to the reception of the truth, and have to be got rid of before the real state of matters can be ascertained. Hence the great importance of deriving your first impressions of the sounds to be heard by auscultation, not from books or lectures, but from the living body itself.

By listening through the stethoscope, placed over the larynx and trachea of a healthy man, you will hear two noises, one accompanying the act of inspiration, and the other that of expiration. These are called the *laryngeal* or *tracheal sounds*, or *murmurs*. If you next place the stethoscope a little to the right or left of the sternum, you will hear the same sounds diminished in intensity. These are the *bronchial sounds* or *murmurs*. If, now, we listen under and outside the nipple on the right side, or posteriorly over the inferior lobe of either lung, we will hear two very fine murmurs. That accompanying the inspiration is much more distinct than that of expiration. By some, on account of its excessive fineness, it is stated that there is no expiratory murmur in health; but this is incorrect. These sounds, then, are the *vesicular respiratory murmurs* which become exaggerated during forced respiration, but in a state of health they never lose their soft character. Again, if we listen in the same places, while the individual speaks, we will hear a peculiar resonance of the voice, which has been called in the first situation, *pectoriloquy;* in the second, *bronchophony;* while in the third it is scarcely audible. A knowledge of these circumstances,

and a capability of appreciating these sounds, are necessary preliminary steps to the right comprehension and detection of the murmurs which may be heard during disease.

The respiratory murmurs are occasioned by the vibrations of the tubes through which the air rushes, according to well-known acoustic principles. Hence they are the loudest in the trachea, finer in the large bronchia, and finest in their ultimate ramifications. The vocal resonance, on the other hand, originates in the larynx; and diminishes or increases—1st, according to the distance of any point from the source of the sound; and 2d, according to the power which the textures have in its propagation.

1. *Alterations of the Natural Sounds.*—All the sounds of which we have spoken, and which can be heard in the lungs during health, may, in certain diseased conditions, be increased, diminished, or absent; their character or position may be changed; and with regard to the respiratory murmurs, they present alterations in rhythm or duration with respect to each other.

Alterations in Intensity.—Respiratory murmurs occurring uniformly on both sides, indicate a healthy condition; when stronger at one place or side, increased action of the lungs. In the same manner there may be feeble respiration simply from diminished action, as in feeble or old persons; but it may also be occasioned by pleurodynia, obstructions in the larynx, trachea, or bronchi, pleurisy, pulmonary emphysema, or exudations filling up a greater or less number of the air-cells and smaller tubes, as in pneumonia, phthisis, &c. Complete absence of respiration occurs when there is extensive pleuritic effusion, or hydrothorax.

Alterations in Character.—The various respiratory murmurs may, in certain conditions of the lung, assume a peculiar harshness, indicative of altered texture. Thus, in incipient phthisis, the vesicular murmur under the clavicle is often *rude*, or *harsh*. In pneumonia, the bronchial respiratory murmur presents a similar character. When a cavity is formed, it becomes what is called *cavernous*, (hoarse or blowing) and in certain cases of pneumothorax, with pulmonary fistula, assumes an amphoric sound.

Alterations in Position.—It frequently happens that the sounds which are natural to certain parts of the chest, are heard distinctly, at places where in health they are never detected. Thus, in pneu-

monia, *bronchial*, or *tubular breathing* may be evident, where only a vesicular murmur ought to exist.

Alterations in Rhythm.—In health, the inspiration is usually three times as long as the expiration. In certain diseased conditions this relation is altered, or even inverted. In incipient phthisis we often find the expiration unnaturally prolonged. In chronic bronchitis and emphysema it is three or four times longer than the inspiration.

New, or Abnormal Sounds, are of three different kinds:—rubbing, or friction, moist and vibrating.

Rubbing, or *friction sounds*, are caused in the pulmonary apparatus by some morbid change in the pleura. These may be so fine as to resemble the rustling of the softest silk, or so coarse as to sound like the creaking of a saddle, grating, rasping, &c.; and between these two extremes we have every intermediate shade of friction noise. This variation in sound is dependent on the nature of the alteration which the pleura has undergone. If covered with a softened, thin exudation, the murmur will be soft; if it be tougher and thicker, louder; if hard, dense, and rough, a creaking, harsh, or grating character. These noises are heard in the various forms of pleurisy.

Moist rattles are produced by bubbles of air traversing or breaking in a somewhat viscous fluid. This may occur in the bronchi, when they contain liquid exudation, mucus, or pus, or in cavities of various sizes. They may be so fine as to be scarcely audible, (*crepitating*,) or so coarse as to resemble gurgling or splashing (*cavernous*.) Between these extremes, we may have every kind of gradation, such as *mucous*, *submucous*, *subcrepitating*, etc., etc. These rattles may be heard in pneumonia, phthisis, pulmonalis, bronchitis, pulmonary apoplexy, etc., etc.

2. *Dry, vibrating murmurs*, arise when the air-tubes are obstructed, constricted, or lose their elasticity. They may be of a fine, squeaking, (*sibilous murmur*,) or of a hoarse, snoring character, (*sonorous murmur*.) Between the two extremes there may be all kinds of variations, to which ingenious people have applied names. These only cause confusion; all that is necessary is to ascertain that the murmur is *dry*, and you will readily understand that the fineness or coarseness of the sound will depend on the caliber of the tube or cavity thrown into vibrations. They are usually heard in cases of

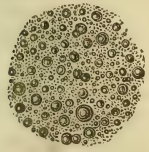
bronchitis and emphysema. Occasionally they present a blowing character, as when ulcers are dry, as in phthisis.

The *vocal resonance*, besides undergoing the changes already noticed, in intensity, character, and position, may give rise to abnormal sounds. Occasionally it presents a soft, reverberating, or trembling noise, like the bleating of a goat, (*ægophony.*) The value of this sign, as indicative of pleurisy, was much overrated by Laennec. At present it is little esteemed. Sometimes the resonance gives rise to a *metallic tinkling*, a noise similar to that caused by dropping a shot into a large metallic basin, or the note produced by rubbing a wet finger round the edge of a tumbler, or glass vessel. This is often best heard immediately after a cough in certain cases of chronic phthisis. Ægophony is supposed to be produced when a thin layer of serous fluid between the pleura is thrown into vibrations. The cause of the metallic tinkling has created great discussion, and is not yet ascertained.

Diagnosis by the aid of a Microscope.—In order to obtain a full benefit from the use of the microscope, the practitioner should carefully study the various structures and tissues of all portions of the body, both in health and disease, as well as the texture of all animal and vegetable substances which constitute the nutriments of the body.

Examination of the Saliva.—To examine the saliva, a drop from the tip of the tongue should be placed upon a glass, and allowed to remain quiet for a moment or two, so that the bubbles of air may collect on the top; then, by applying a magnifying power of two hundred and fifty or three hundred diameters, you will observe salivary corpuscles, which are colorless, spheroid bodies, varying in size, containing a nucleus, occupying about one-third of the field. The balance of the field is filled with molecules and granules cells; and epithelial scales which are derived from the mouth, and variously shaped, but which are usually oblong or squarish. The saliva may present various alterations, depending on diseases. Thus, where there is ulceration of the mucous membrane, there is an increase of the molecular, granular, and epithelial matter. In some cases inflammation of the mucous membrane gives rise to morbid growths. These are found mostly upon the borders of aphthous or ulcerated portions of the mucous surface.

Milk.—On examining a drop of milk, we observe a number of milk corpuscles floating in a clear fluid: these bodies, in healthy milk, are spherical, with dark margins. The globules consist of a delicate envelope of casine, enclosing a drop of oil or butter. The act of churning consists in liberating these fat corpuscles. The richness of the milk is determined by the quantity of the globules. Water separates the globules. Flour exhibits the starch corpuscles, which are changed blue by the action of iodine. Chalk shows numerous irregular mineral particles. Brain substance can be distinguished by large oil globules, mixed with nerve tubes. Healthy milk may be recognised by the uniformity and size of the globules. In some cases milk is mixed with pus and blood.



Milk. FIG. 5.

Blood.—On examining a drop of blood, there will be seen a large number of bi-concave discs, rolling in the field of the microscope, which soon exhibit a tendency to turn upon their edge, and arrange themselves in rolls, and a few colorless ones mix with them. The colored blood-corpuscles vary in size from the one-five-thousandth to the one-three thousandth of an inch. Owing to their bi-concave form, they present a bright external rim, with a central shadowed spot, or a bright centre and a dark edge, according to the focal point in which they are viewed. If the blood be exposed to the air a little time before examination, or if obtained by venesection, the edges of the corpuscles may often be observed to have lost their smooth outline, and to have become irregular, notched, serrated, beaded, etc. On the addition of water, the blood discs become spherical, and lose their color. On adding syrup, they become flaccid and irregular.

The colorless corpuscles of the blood are spherical in form, and vary in size from the one-two-thousand-five-hundredth to the one-two-thousandth of one inch in diameter. Their surface presents a molecular or dotted appearance.

In certain internal hemorrhages the blood-corpuscles break down, or become partially dissolved. When the external envelope is seen very transparent, the shadowed spot disappears, and there is found in their interior one or more granules. The liquor sanguinis also contains an unusual number of granules.

6.

Fig. 6 shows blood-corpuscles, drawn from the extremity of the finger. On the right of the figure they are isolated, some flat and on edge, others having a dark and others a light centre, according to the focal point in which they are viewed. On the left of the figure several rolls have formed. Two colorless corpuscles and a few granules are also visible.

The same change is occasionally observable in the blood extravasated below the skin in scurvy, or purpura hemorrhagica.

We have seen that, in a healthy condition, the blood possesses very few colorless corpuscles; but there is a certain state of that fluid, "Leucocythemia," Fig. 7, or white-cell blood, in which they are very numerous, and generally associated with enlargement of the spleen, or other lymphatic glands.

FIG. 7.

It has been affirmed that the color and number of the corpuscles of the blood undergo a change in plethora, fever, jaundice, dropsy, cholera, etc.

Occasionally the serum of the blood presents a lactescent appearance; and, on being allowed to remain at rest some hours, a white, creamy pellicle forms on the surface. This consists of very minute particles of oil, resembling the smaller molecules found in milk, and in the chyle.

FIG. 8.

FIG. 9.

When pus is examined, if healthy, numerous corpuscles are observed floating in a nearly transparent fluid; by adding acetic acid the cell walls are destroyed, and three, four, or more granules, constituting the nuclei, are liberated. In scrofulous or unhealthy pus, as shown in fig. 10, these bodies are surrounded by another fine membrane with irregular outlines, which appear to be composed of numerous molecules or granules. Fig. 9 represents the pus corpuscles after the addition of acetic acid and the liberation of the nuclei, and fig. 8 shows the appearance of the pus in a healthy condition.

FIG. 10.

Vomited Matters.—The first substance observed in vomited matters is the food in various stages of decomposition; and if there be either chronic or acute inflammation, there will be mingled with this, portions of epithelial lining from the membrane of the stomach, and other parts of the digestive tube. The new formations which occur in the stomach are mostly vegetable fungi, such as *torulæ* and sarcina ventriculi. In addition to the above the vomited matters may contain pus, blood, cancer-cells, bile, etc., etc.

Fæces.—On examination of the fæces, all the elements which enter into the composition of the food will be observed. In typhoid, and other malignant affections, the fæces will contain large crystals of phosphates and carbonates. They also contain numerous torulæ.

Uterine and Vaginal Discharges.—The menstrual discharge is composed of old and young epithelial scales and blood globules; and in cases where the menstruation is connected with disease of the mucous membrane of the uterus or vagina, with pus globules. The gelatinous discharge, which is always observed immediately after menstruation, consists of mucus, in which are found a large number of epithelial cells. The blood, which is found in the menstrual and leucorrhœal discharge, is altered by exosmosis. In leucorrhœa and dysmenorrhœa, in addition to the albuminous exudation, blood, pus, and patches of epithelium may be found. In cases of a cancerous affection of the uterus or vagina, cancer-cells will be detected.

Mucus.—The fluids secreted by the mucous membrane are of a gelatinous character; and when the membrane becomes inflamed, or otherwise diseased, the mucous cells are converted into pus corpuscles.

Dropsical Fluids.—On examining dropsical fluids, some peculiarities frequently present themselves; as, for instance, in the fluid collected in the tunica vaginalis, testes, spermatozoa will frequently be found. In other dropsical fluids, pus corpuscles, epithelial scales, and cancer cells are sometimes found.

Urine.—Healthy urine is transparent. In some constitutional disorders, however, various substances are found, the most important of which we will shortly notice.

Prof. Oldshue, in his work on Urino-Pathology, gives three pro-

minent modes whereby the urine may be examined, viz.: optically, chemically, and microscopically. *Optically.*—Noticing its transparency, opacity, fluidity, turbidity, or limpidity. These have their diagnostic importance, and in the progress of examinations throw a flood of light upon the nature of the case.

The principal coloring matters are generally few and very easily determined. Some of the most common are thus noticed by the Professor. *Purpurine:*—"A peculiar coloring matter, always combined with urate of ammonia, varying in tint from a mere flesh color to the deepest carmine, indicating hepatic derangement, affection of liver, spleen," etc.

"*Cyanorine* gives a blue color to urine. Diluted acids dissolve it, and change it to brown or red."

"*Indigo*, sometimes found in urine, gives it a dark blue color."

"*Hemaphœn* is the yellowish coloring matter. The jaundiced hue of persons in a state of anæmia and chlorosis, is probably owing to its presence in excess. *Cholesterine* is supposed to give the coloring principally to bile. It frequently occurs in a crystalline state in animal fluids, in the blood, bile, fluid of hydrocele and uterine hydatids. It forms the chief ingredient of biliary calculi, and often gives the urine a deep brown color."

"*Hœmatosin* is the coloring matter of the blood, and the most general one found in the urine, varying in color from the brightest red to the darkest brown. Hæmatoxylin, administered medicinally, will often, by the red color it communicates to the urine, lead to an unfounded suspicion of the existence of hematosin. Mucus, pus, milk, fat, etc., have the effect of changing the color and optical appearance of the urine, but may be known by their different qualities."

Chemically.—After the urine is fully surveyed, and all its peculiarities as to color, consistence, etc., are noticed, the changes which certain chemical agents may produce will sometimes establish certain other facts yet unobservable. The character of these changes are principally determined by their optical appearances also, to be noted at the same time. The first chemical manipulation involves the determination of the acidity, alkalinity, or neutrality. "If the urine be very acid in its reaction, and deposit a red, pink, buff-colored, or white precipitate, the chances are that the precipitates

are urates or uric acid. If, upon pouring out the urine, the bottom of the vessel be stained with an even powdery coating, it is likely to be *lithates*. If hard crystalline grains adhere to the sides and bottom of the vessel, *uric acid*. If either acid, alkaline, or neutral urine be *turbid* on emission, deposits a whitish, yellowish or red sediment, and is not rendered transparent by heat, it contains either phosphates, oxalate of lime, cystine, mucus, pus or blood. If *phosphates*, it will be rendered transparent by acetic acid. If *cystine*, it will be dissolved by ammonia. If *oxalate of lime*, it will not be affected by acetic acid nor aqua-ammoniæ. If not dissolved by any of the above, it is mucus or pus; or if red, it is blood."—*Dr. Aldridge.*

Microscopically.—Having examined a specimen of urine optically and chemically, it may be inspected microscopically. By this method, we ascertain the precise character of each deposit, and the nature of the disease, and the condition of the part from which it is derived.

Dr. Bennett gives the following description of the various substances recognizable in the urine:—

"*Uric Acid.*—Uric acid crystals are almost always colored, the tint varying from a light fawn to a deep orange red. The general color is yellow. They present a great variety of forms, the most common being rhomboidal. The lozenge-shaped and square crystals are more rarely met with, and are isolated and in groups. Not unfrequently they present adhering masses, or flat scales, with transverse or longitudinal markings. Occasionally they assume the form of truncated round columns, with other structures.

"*Urate of Ammonia* most commonly assumes a molecular and granular form, occurring in irregularly aggregated amorphous masses. This may be separated from a similar-looking deposit of phosphate of lime by the action of dilute muriatic acid, which immediately dissolves the last-named salt, but acts slowly on urate of ammonia, setting free the uric acid. Sometimes, however, it occurs in spherical bodies of a bistre brown color, varying in size from the one-five-thousandth to the one-two-thousandth of an inch in diameter. The latter size rarely occurs. Occasionally they assume a stellate form, needle-like or spicular prolongations coming off from the spherical body. I have seen both these forms associated, and the former so

curiously aggregated together as to assume the appearance of an organic membrane, for which by some observers it was mistaken, until it was found to dissolve under the action of dilute nitric acid.

"*Triple Phosphate of Ammonia,—Phosphate of Magnesia.*—These crystals are very commonly met with in urine, and are generally well defined, presenting the form of triangular prisms, sometimes truncated, at others having terminal facets. If an excess of ammonia exist, or be added artificially, they present a star-like or foliaceous appearance, which, however, is seldom seen at the bed-side.

"Most of the forms of urate of ammonia are associated with the triple phosphate.

"*Oxalate of lime* most commonly appears in the form of octahedra, varying in size, the smaller aggregated together in masses. Once seen, these bodies are readily recognized. Very rarely they present the form of dumb bells, or of an oval body, the central transparent portion of which presents a dumb bell shape, while the shadowed dark portion fills up the concavities.

"*Cystine* takes the form of flat, hexagonal plates, presenting on their surface marks of similar irregular crystals. Occasionally their centre is opaque, having radiations more or less numerous, passing towards the circumference.

"In addition to the various salts found in the urine, there may occasionally be found different organic products, such as blood and pus corpuscles, spermatozoa, vegetable fungi, exudation casts of the tubes, or epithelial scales from the bladder or mucous passages. Frequently one or more of these are found together.

"Very rarely casts of the tubes, principally composed of oily granules, may be seen, or epithelial cells, more or less loaded with similar granules, several of which also float loosely in the urine.

"Although these casts of the tubes were at one time confounded together, they may now be separated into at least four distinct kinds, namely, fibrinous or exudative; desquamative; fatty; and waxy casts. The inferences to be derived from the presence of one or more of these will be especially dwelt on in the section which treats of urinary diseases.

"Spermatozoa are occasionally found in the urine, but must not be considered as of any importance, unless accompanied by the peculiar symptoms of spermatorrhœa. The presence of torulæa in

considerable quantity is indicative of the existence of sugar, which requires, however, for its confirmation, the application of chemical tests.

"All the various appearances here noticed are only diagnostic when accompanied by concomitant symptoms. Alone, they are not to be depended on; but, in combination with the history and accompanying phenomena, they are capable of affording the greatest assistance in the detection of disease."

Cutaneous Eruptions and Ulcers.—Pus taken from all kinds of eruptions and sores, presents the same appearance; thus, the pus taken from eczema and variola is identical in character. Squamous eruptions of the skin consist of psoriasis, pityriasis, and ichthyosis. The dry scales, found on the surface in these diseases, consist of flakes of epidermis, more or less aggregated together. The tumors found on the skin which are of an epidermic character, assume the form of callosities, condylomatous warts and corns. They

Fig. 11.

all consist of epidermic scales, more or less condensed. The favous crust consists in epidermic scales, lined with a fine granular mass, from which millions of cryptogamic plants originate and fructify. In cutaneous ulcers of a healthy character the surface is covered with normal corpuscles. In scrofulous or unhealthy sores, the pus is more or less broken down. In cancerous ulcers of the skin, the fluid obtained from the ulcer will be observed to be full of cancer cells. (See fig. 11.)

Appearance of section of cancerous ulcer of the skin; a, epidermic scales and fusiform corpuscles on the external surface; b, groups of epidermic scales; c, fibrous tissue of the dermis; d, cancer-cells infiltrated into the fibrous tissue, and filling up the loculi of the dermis.

Chemical Tests in Diagnosis.—In practical medicine the most important chemical tests are those which detect the presence of albumen, bile, sugar, and chlorides in the urine. To detect albumen, boil a small portion of urine in a test tube; and if there be albumen, the urine will become thick, and present the character resembling that of the white of an egg boiled in water. To detect bile, add a few drops of nitric acid to a dram or two of urine; and if bile be present, the urine will assume a greenish appearance. To detect sugar in the urine, a few drops may be placed on a slip of glass, and held over a spirit lamp until the urine be evaporated. If sugar be present, a dark sediment will remain on the glass. Trommer's test consists in adding a few drops of a solution of copper, which gives the urine a pale blue color. Liquor potassæ is then added until the hydrated oxide of copper thrown down is again dissolved. Then boil the solution, and if sugar be present, the mixture will assume a yellowish-red tint. If the urine contains no sugar, a dark green precipitate will be thrown down. To detect chlorides in the urine, add to urine in a test tube one-sixth part of its bulk of nitric acid, and then add a few drops of a solution of nitrate of silver. If chloride be present, the chlorine will be thrown down with silver as a white precipitate. If none be present, the fluid will remain clear.

Examination of Patients.—There are various methods adopted by practitioners for the examination of special cases of disease. The method which I have been in the habit of pursuing is the following:—

1st. What is your name, age, occupation, and place of nativity?

2d. What is the duration of your disease,—and, as far as you can, describe its seat, nature, and cause. If the disease be accompanied with pain, place your hand over the region of its locality; and describe its nature, whether acute or severe, or heavy, dull, and throbbing.

3d. We proceed to a systematic examination of all the principal organs of the body; and first, the circulatory system, including the heart and all the principal blood-vessels; the situation of the heart, its rhythm, impulses, the locality of the apex. By percussion we learn its extent, and area of dulness; by auscultation we learn the character of the sounds: if abnormal, their position; by

palpation and inspection, the nature and character of the arterial pulse, the existence of aneurism, &c., &c.

4th. You proceed to an examination of the respiratory system, the nares, its discharges; the voice, natural or altered in quality, hoarseness; difficulty of speech, aphonia; epiglottis; tonsils and pharynx; the lungs; state of respiration, difficult, quick or slow, equal or unequal, labored, painful; dyspnœa; odor of breath; character of expectoration; hemoptysis; color, appearance and amount of blood discharged; cough, rare or frequent, short, long, or painful, moist or dry; external form of the chest by inspection; the resonance determined by percussion, whether increased or diminished; dulness, cracked-pot sound, &c., &c. The sounds determined by auscultation, whether normal or abnormal; their character, position, &c.

5th. Nervous system; the character of the brain, as indicated by intelligence, cephalalgia, hallucinations, delirium, stupidity, dreams, vertigo, idiocy, monomania, coma. Spinal cord and nerves; general sensibility, increased, diminished, or absent; pain in the back; special sensibility—hearing, taste, sight, touch, smell; their perversion, increase or diminution; spinal irritation, as determined by percussion; trembling, contractions, paralysis, rigidity, convulsions: motion, natural or perverted, pain on movement, fatigue.

6th. Digestive system—mouth, taste, lips, gums, and teeth; tongue—moist or dry, mode of protrusion, furred, fissured color, coated, condition of papillæ. Fauces, œsophagus, tonsils, and pharynx—regurgitation; deglutition, if impeded, examine the pharynx with a spatula; the neck, the cervical glands, &c. Stomach—epigastric uneasiness or pain, nausea, thirst, flatulence, appetite, swelling, eructations, vomiting, character of matters vomited. Abdomen—hemorrhoids, pain, distention or collapse, diarrhœa, borborygmi, character of dejections, constipation, tumors; its preparation and measurements. Liver—the size, as determined by percussion, jaundice, results of palpitation, pain, &c. Spleen—the size, as determined by percussion. If enlarged, examine the blood microscopically.

7th. Genito-urinary system. Uterus—amenorrhœa, leucorrhœa; condition of the menstrual discharge; dysmenorrhœa, &c.; uterine or ovarian tumors; if pain, or much leucorrhœal discharge, examine

os uteri and vagina with a speculum; difficulty in walking, or in defecation; pain in the back; functions of the mammæ. Kidneys—micturition, lumbar pain; precipitates, as determined by the microscope and by chemical tests; quality and quantity of urine, the specific gravity; color; action on test papers; spermatorrhœa; stricture; action of heat, nitric acid, &c.; discharges from urethra.

8th. Integumentary system. Emphysema; temperature; general posture; marks or cicatrices; anasarca; expression of countenance; emaciation; rough or smooth; morbid growths, swelling; external surface; eruptions, (see diagnosis of skin diseases;) color; œdema; perspiration; dry or moist.

9th. Antecedent history—parentage, age, constitution, place of residence, habits, irregularities in diet, mode of living as regards food and drink, hereditary disposition, excesses of any kind; trade or profession; exposure to heat, moisture or cold; fatigue, epidemics and endemics, commencement and progress of the disease, contagion, and infection; mode of invasion; in female cases, whether married or single; have had children and miscarriages, previous diseases, &c.; date of rigor or seizure; previous treatment, &c.

In the examination of chronic diseases, it is all-important to learn the influence of medicines, especially when the patient has been under Old School or Homœopathic medication, as the effect of arsenic and mercurials produce many constitutional difficulties, liable to mislead the practitioner.

SECTION II.

PATHOLOGY.

By pathology is understood that department of medicine which explains the nature, causes and condition of tissues produced by the various morbid influences contributing to the alteration of tissues, which constitutes the basis of all organic affections. In order to intelligently investigate these pathological conditions, it is essential that we should briefly study the elementary character of the tissues themselves.

Much difficulty exists in ascertaining from what parts of the body *action* really proceeds. Physiological investigations have demonstrated that cell formations are the ultimate morphological elements in which there are any manifestations of life, and that we must not transfer the seat of real action to any point beyond the cell. By ordinary vegetable cellular tissue is understood one which in its most simple form seems to be composed of four or six-sided, or roundish, or polygonal bodies, in which a tolerably thick, tough wall (membrane) is always seen. If now a single one of these bodies be isolated, a cavity is found in whose interior fat, starch, pigment, or albumen may be deposited.

Cellulose, the substance which forms the external membrane, is generally found destitute of nitrogen, and yields, on the addition of iodine and sulphuric acid, a peculiarly beautiful blue tint. But when the cell is quite a simple one, its contents are changed to a brownish or yellowish mass, isolated in the interior of the cell cavity, as a special body (protoplasma,) around which can be recognized a special, plicated, frequently-shrivelled membrane (primordial utricle.) Even rough chemical analysis generally detects, in the simplest cells, in addition to the non-nitrogenized (external) substance, a nitrogenized internal mass; and vegetable physiology seems there-

fore to have been justified in concluding, that what really constitutes a cell is the presence, within a non-nitrogenized membrane, of nitrogenized contents, differing from it.

Vegetable cells cannot, viewed in their entirety, be compared with all animal cells. In the latter, we find no such distinctions between non and nitrogenized substances; in all the essential constituents of the cells, nitrogenized matters are met. There are, however, certain forms in the animal body which stand in very close relation to vegetable tissues, and among these none are so characteristic as the *cells of cartilage.* In every vegetable cell we expect to find a nucleus. This nucleus offers greater resistance to the action of chemical agents than the external parts; and in spite of the greatest variation in the external form, it generally maintains its shape; therefore, we may define a *nucleus as that part of the cell which is most constantly found unchanged.* One nucleus sometimes encloses another structure within itself, *nucleolus.* Another essential constituent of the cell is its contents. Within the cell wall, pigment granules are observed floating in the cell fluid. The cell may develop itself into a nerve-fibre, but the nucleus remains lying on the outside of the medullary substance. Hence, it follows, that the special peculiarities which individual cells exhibit, are dependent upon the properties of the cell-contents, and that it is the *contents,* and *not* the *membrane* and nucleus, which give rise to the functional differences of tissues.

Owing to the abundant mass of matter (intermediate intercellular substance) around the cells, it is often difficult to distinguish the boundary of one from another.

Many obstacles have been met in mastering the pathological condition of tissues, but these have, however, been recently obviated, by giving, first, a simple and comprehensive sketch of their *physiological* relations. Formerly, fibres were regarded as the groundwork of nearly all the parts of the body, and the different tissues were reducible to fibres, as their ultimate constituents. Some went so far as to suppose that the fibres were made of globules, arranged in lines. These globules (granules, molecules) have, curiously enough, maintained their ground, and even now, there are few histological works which do not commence with the elementary granules. In a few instances, these views have acquired such ascendency, that the

composition both of the primary tissues in the embryo, and also of the later ones, are based upon them. A cell was thought to be produced by the globules arranging themselves in a spherical form, so as to constitute a membrane, within which other globules remained, and formed the contents. The supporters of the *investment theory* imagined that, originally, a number of globules existed, scattered through a fluid, but that, under certain circumstances, they gathered together, so as to constitute a compact heap or globe, and that this globe was the starting-point of all further development, a membrane being formed outside, and a nucleus inside by the successive changes of the mass, by apposition or intussusception. However, at the present time neither fibres, globules, nor elementary granules can be looked upon as histological starting-points. As long as living elements were thought to be produced out of parts variously destitute of shape, any one of these views could be entertained; but it is in this very particular, that so marked a change has been brought about. In pathology we can now go so far as to establish, as a general principle, *that no development of any kind begins de novo, and consequently reject the theory of equivocal generation just as much in the history of the development of individual parts, as we do in that of the entire organism.* Tissues may be divided into three classes: those which consist entirely of cells, where cell lies close to cell; those in which the cells are regularly separated from another by intercellular substances (to this class belong those comprehended under the name of connective tissue,) and those in which the cells have attained specific, higher forms of development, which appertain to the animal economy. These are the ones which are really characteristic of animals, and to this class belong the nervous muscular systems, the vessels and the blood.

If we consider the simple cells a little more attentively, we will find that those of which we can best obtain a general idea, are the *epithelial formations*, such as we meet with in the epidermis and the rete Malpighii, upon the external surface of the body, and in the cylindrical and scaly epithelium of mucous and serous membranes. Their general plan is, that cell lies close to cell, and nothing at all is found between them. If the cells are developed under such circumstances, and less resistance is offered in one direction, they will shoot in that direction and become very long, while in the other they

remain very narrow: thus, singularly irregular forms are met, as on the surface of the urinary passages.

In the cuticle many layers of cells lie one above the other (which is not the case in many mucous membranes,) and the young layers (the *rete Malpighii*) can easily and conveniently be separated from the older ones (the epidermis proper.) On examining a perpendicular section of the surface of the skin, we see a very dense stratum. Beneath this we find the rete mucosum, and next to this, in a downward direction, the papillæ of the skin. Between the rete and the epidermis, there succeed cells which are flattened, but in a less degree than those on the surface, and within which very distinct nuclei may be noticed. The further we advance inward, the smaller the cells become, the last of them standing in the form of little cylinders, upon the surface of the papillæ. In the uppermost layers of the epidermis, the cells become every where flatter: toward the external surface no more nuclei can be seen in them. There is no original difference between the epidermis and the rete, the latter is only the youngest layer of the former. Between the lower layers of the rete and the surface of the cutis vera, there are no intervening layers; there is no amorphous fluid or blastema to be found in which the cells could be generated, but they lie in direct contact with the papillæ of the connective tissue of the cutis. There is no space, as was thought to be the case until within a short time ago, into which fluid transudes from the papillæ, and the vessels contained therein, in order that new cells may arise and develop themselves out of it; but throughout the whole series of the layers of cells of the rete and epidermis, the same relations exist that we are familiar with in the bark of a tree.

Epithelial cells may undergo a series of transformations, which sometimes render it impossible for those who are unacquainted with the history of their development to realize their original epidermic nature. The greatest abnormity of this kind is met in the *crystalline lens* of the eye, which is, originally, a mere accumulation of epidermis. It originates in a saccular involution of the external skin. At first, its connection with external parts is maintained by the *membrana capsulo papillaris:* afterwards this atrophies, and leaves the lens isolated in the interior of the eye. The fibres of the lens are nothing more than epidermoidal cells, which have been developed

in a peculiar manner, and their regeneration, after the extraction of a cataract, for example, is only possible as long as there still remains epithelium in the capsule to undertake the new formation, and to represent, as it were, a thin layer of rete Malpighii. This reproduces the lens in the same way that the ordinary rete Malpighii of the external surface does the cuticle.

With the history of epithelial elements is immediately connected that of a peculiar class of structures, which perform an important part in accomplishing the functions of the animal, viz.:—*glands*. The really active elements of these organs are of an epithelial nature. Their formation is as follows:—At a certain point an epithelial cell begins to divide, and goes on dividing again and again, until by degrees a little process composed of cells grows inward, and spreading out laterally, gives rise to the development of a gland. Thus arise the sudoriferous, sebaceous, mammary and stomach glands and liver. Generally speaking, glands consist of accumulation of cells, which usually form open canals. Except those glands whose functions are uncertain, as the thyroid body and supra-renal capsules, the *ovaries* form the only variation from this rule, inasmuch as their follicles are only open at times; yet they must be open when the ova is secreted.

Previously, connective tissue was almost universally regarded as composed of fibres. There have arisen many theories respecting its formation, many of which are quite absurd; but the whole series of lower tissues may be reduced to one simple plan. Usually the greater part of the tissue is composed of intercellular substance, in which, at certain intervals, cells lie imbedded, which, in their turn, present the most variable forms. But these tissues cannot be distinguished by one containing only round, another, on the contrary, only caudate or stellate cells; but in all connective tissues, round, long, and angular cells may occur. The simplest case is where round cells lie at certain intervals, and intercellular substance appears between them, as in *hyaline cartilage*. Every tissue is called connective tissue, the base of which yields gelatine when boiled—the intercellular substance of cartilage, chondrine, and mucous tissue, mucin. A few solitary points of difference, in regard to peculiarity of form and contents, may be presented by individual cells, at some later period of their existence. What we concisely designate as

fat, is a tissue which is intimately connected with those of which we have been treating, and is distinguished from the rest by the fact that some of the cells enlarge and become filled with fat, the nucleus being therefore thrust to one side. In itself, however, the structure of adipose tissue, is precisely the same as that of connective, and, under certain circumstances, the fat may so completely disappear, that the tissue is once more reduced to the state of simple, gelatinous, connective, or mucous. Among those different species of connective tissue, the most important for our present pathological views, are those in which a reticular arrangement of the cells exists, or, in other words, in which they anastomose with one another. Wherever such anastomoses take place, it may be demonstrated, with some degree of certainty, that they constitute a peculiar system of tubes or canals, which must be classed with the great canalicular system of the body. Those tissues which possess anastomoses of this description, may be distinguished from those whose elements are isolated, by the greater energy with which they are capable of conducting different morbid processes.

The *elements of muscle* are generally regarded as the most simple of all the forms of tissues. If we examine an ordinary red muscle we find it composed of a number of cylinders, for the most part of equal thickness (primitive fasciculi,) which, in a transverse section, have a cylindrical form, and on which we perceive broad lines, generally running transversely through the fasciculus, with a somewhat wavy outline, and are almost as broad as the intervals that separate them. In addition to this transverse striation, we also see striæ following a longitudinal direction. If now we add acetic acid, nuclei will be disclosed immediately beneath the sheath, which contain more or less nucleoli. This striation is altogether internal; the membrane, in itself, is perfectly smooth and even; the transverse striation belongs to the contents, which, when seen in a mass, form the red substance of the muscle. It is this substance that has the property of contractility, which varies in appearance according to its state of contraction, becoming broader when contracted, whilst the intervals between the individual transverse bands become somewhat narrower, so that a change in the arrangement of its minutest constituents takes place. The contents of a primitive fasciculus consist of a certain number of fine longitudinal fibres,

every one of which contains minute granules, corresponding in position to the transverse striæ, and held together by a pale, intervening substance. Now, since a considerable number of primitive fasciculi lie, in apposition, side by side, there arises, in consequence of the symmetrical position of the little granules, the appearance of discs, which really do not exist. These parts assume an altered position, with regard to one another, in proportion to the activity of the muscle; during contraction, the granules are approximated, whilst the intervening substance becomes shorter, and, at the same time, broader. Compared with this the structure of the smooth, organic, or involuntary muscular fibres appears much more simple. On examining any part of these organs in which smooth, muscular fibres are contained, we find generally, just as is the case with the transversely striated muscles, little fasciculi, as, for example, in the muscular coat of the urinary bladder. Upon further investigation, a series of distinct elements can be distinguished within these fasciculi, of which a certain number are held together by a common connective substance. On separating these fasciculi into their more minute constituents, we find them to consist of long spindle-shaped cells, usually containing a nucleus in the centre.

Atrophy in muscles, is generally characterized by a diminution in the diameter of the primitive fasciculi affected: in fatty atrophy, a more palpable change is added, little rows of fat globules appear in the interior of the primitive fasciculus, during the accumulation of which the proper contractile substance decreases in bulk. The more fat there is, the less contractile substance, or, in other words, the muscle becomes less capable of performing its functions in proportion as the normal contents of its fibres diminish. The contractility of the human body is only exemplified in the *substance of the muscle*, although, in former times, many other things, for example, certain forms of connective tissue were assumed to be contractile. In the human skin, there lie little muscles, about as large as the smallest fasciculi, in the parietes of the urinary bladder—bundles, consisting of diminutive fibre cells, which run from the base of the hair-follicles towards the surface of the skin, and, when they contract, approximate the two. The result of this is, that the skin becomes uneven, and we have what is termed a *goose-skin* (*cutis anserina.*)

A capillary vessel, is a simple tube in which may be discovered a simple membrane, enclosed, with flattened nuclei, which usually lie more at the sides than in the elements of muscle, and therefore have more frequently an awl-shaped appearance, from their sharp border alone being perceived. This most simple class of vessels is known as the capillaries.

Now, that we have completed a survey of the physiological tissues, we will dwell for a short time on the pathological ones. By pathological tissues are meant those only which really constitute pathological new formations. The same general types which we have established for the physiological tissues, hold good for the pathological ones. Every pathological structure has a physiological prototype; and no form of morbid growth arises, which cannot, in its elements, be traced back to some model which had previously maintained an independent existence in the economy.

The classification of pathological new formations, was formerly based upon their different degrees of vascularity; but this is incorrect, as we have physiological tissues without vessels, as, for example, *cartilage*. In pathological formations those elements the most frequently exist, and the more decidedly prevail, which do not represent the higher grades of really animal development; and therefore, on the whole, the most rarely imitated ones belong to the more highly organized, and especially to the muscular and nervous systems. Still, these formations are by no means excluded: we find pathological new formations of every description, no matter to what tissue they are analogous, provided it possess distinctive features. It is only with regard to their frequency and importance that a difference prevails, and this is of such a nature that the great majority of pathological productions contain cells analogous to epithelial ones, or to the corpuscles of the connective tissues, and of those structures which we have included in the last class of normal tissues; the vessels and parts which may be compared with lymph and lymphatic glands, are the most frequently met with as new formations, whilst real blood, muscles and nerves are the more seldom found as such. Having arrived at such a simple view of the matter, the question arises, What becomes of the doctrine of the *heterology* of morbid products? To this question I can return no other answer, than that there is no other kind of heterology in mor-

bid structures than the abnormal manner in which they rise, and that this abnormity consists either in the production of a structure, at a point where it has no business, or at a time when it ought not to be produced, or to an extent which is at variance with the typical formation of the body. If we consider the structures which are called heterologous, with reference to the points at which they arise, they may easily be separated from the homologous ones by their deviating from the type of the part in which they arise. All such formations are included under the term *hypertrophy*, which means those cases in which the individual elements of a structure take up a considerable amount of matter, and thereby become larger; and in consequence of a simultaneous enlargement of a number of elements, at last the whole of an organ may become swollen. When a muscle becomes thicker, all its primitive fasciculi become thicker. A liver may become hypertrophied, simply in consequence of a considerable enlargement of its individual cells. In this case there is real hypertrophy, without, properly speaking, any new formation. Essentially different from this process are the cases in which an enlargement takes place in consequence of an *increase in the number of the elements*. A liver, may also become enlarged by a very abundant development of a series of small cells in the place of the ordinary ones. Hyperplastic processes, (numerical hypertrophy) in all cases produce a tissue similar to that of the original part: hyperplasia of the liver gives rise to new hepatic cells; that of a nerve to a new nerve substance; that of the skin to a fresh production of the elements of the skin. A heteroplastic process, on the contrary, engenders histological elements, which correspond, indeed, to natural forms—elements, for example—resembling in structure those peculiar to glands, nerve substance, the connective and epithelial tissues; but these do not rise in consequence of a simple increase in the number of such as previously existed, but in consequence of a change in the original type of the parent tissue.

In the case of all tissues of a like nature, it is quite possible to find one, at a certain fixed point of the body, replaced by an analogous one, belonging to the same group, or, in other words, by a *histological equivalent*—as, for example, a spot invested with cylindrical, may acquire scaly epithelium; a surface upon which cilia were originally seen, may afterwards be found to have ordinary epi-

thelium, etc. But the most striking instances of such substitutions are met with in *muscles*. One animal has transversely striped muscular fibres, in the same place that another has smooth ones. In diseased conditions, pathological substitutions occur, in which a given tissue is replaced by another; but even when this new tissue is produced from the previously existing one, the new formation may deviate, more or less, from the original type. There is, therefore, a great chasm between physiological and pathological substitutions, or, at least, between the physiological and certain forms of the pathological ones. *Physiologically*, the substitution is constantly effected by the introduction of another tissue of the same group (*homology;*) *pathologically*, very frequently by the agency of a tissue belonging to another (*heterology.*)

Nutrition.—According to the ideas usually entertained with regard to nutrition, the vessels are considered as not only possessing the power of accomplishing the interchange of material, but, also, of influencing actively the condition of the neighboring histological constituents. We only speak of *action* in the *vessels as far as muscular fibres are present in them*, and the vessels are thus enabled by the contraction of these fibres, to grow narrower or shorter. This narrowing of their channel may have the effect of impeding transudation of fluids, while, on the contrary, in the case of the relaxation or paralysis of the muscular fibres, the widening of the vessel may favor such transudation. Let us admit this for the present, but before proceeding farther, we will enter somewhat into the analysis of the mass of tissue which lies around the vessels. If we select parts where the vessels lie very closely packed, and there is perhaps nearly as much vessel as tissue, as, for example, the liver, in which this condition really exists, we see that the interstices which are left between the vessels are filled with quite a small number of cells. If we examine a single acinus of the liver by itself, we find in its centre the vena centralis or intralobularis; which runs into the hepatic vein, at the peripheral branches of the portal vein, which sends capillary twigs into the interior. These at once form a network, which at first has long, but afterwards more regularly shaped meshes, and extends in the direction of the hepatic vein, and at last terminates in it. The blood, therefore, after it has entered the interlobular vein, flows through the capillary network into the

vein, whence, by means of the hepatic veins, it is conducted back again to the heart. In the case of an injected liver, this network is seen to be so close, that what interstices there are left seem almost to occupy less room than the vessels themselves. It is plain, therefore, that the capillary and hepatic cell networks are interwoven in the most intricate manner, so that cells belonging to the parenchyma of the liver every where lie in almost immediate contact with the walls of the vessels, there being at most a fine layer between the cells and the walls. In this extremely simple case, a tolerably simple relation may certainly be assumed to exist between the vessels and the cells; it may be conceived that the blood which flows through the vessels may, in proportion to the degree in which they are contracted or dilated, and to its own quantity, exercise a direct influence upon the adjoining cells. In most parts, however, the relations do not present such a simple form as in the *liver*, considerable interstices often separate the individual cells, and no inconsiderable quantities of these elements are enclosed in every capillary mesh; as in the *brain*, and the *muscular coat* of the *stomach*. If we go on in this way examining the structure of the different organs and tissues, we pass from such as, when injected, seem to consist almost entirely of vessels, in time, to those which contain scarcely any, and at last to such as really have none at all. This is most strikingly illustrated in the connecting tissues, and the most important among these are *bone* and *cartilage*. Perfectly developed cartilage has no longer any vessels; perfectly developed bone certainly contains vessels, but in a very variable degree. With regard to the *bones* themselves, the disposition of their blood vessels is in itself tolerably simple, but at the same time very characteristic. If we examine the compact substance, we can usually see, even with the naked eye, small openings through which vessels enter from the periosteum. With a moderately high magnifying power, we discover that these vessels form beneath the surface a network with somewhat long meshes, or a series of tubes anastomosing with one another, and running longitudinally. Between these meshes there remain wide interstices, within which, precisely as in the case of cartilage, we see the *bone-corpuscles*, lying longitudinally, parallel to the surface. Between them lies the proper osseous tissue, deposited in lamellar layers, some

of them parallel to the surface, others concentrically arranged around the vessels. In the deeper layers of the compact substance, this concentric arrangement around the vessels constantly prevails. Between these more lamellated parts is left a small quantity of osseous substance, which is formed of little columns generally perpendicular to the axis of the bone, but sometimes curved round, and so become parallel to the long axis. These are the remains of the spicula first formed during the growth of the bone in thickness, and therefore are of older date. The vessels themselves cannot for the most part be any longer distinguished, the cavities (canals) into which they run are improperly called medullary canals, inasmuch as there is usually no marrow contained in them; their correct name is *vascular* canals. Immediately surrounding them we see a series of peculiar structures, oblong or roundish bodies, which usually appear black when the object is not fully brought into focus, and are provided with jaggs or processes.

Nutrition of Bone.—The hard basis substance which lies between the bone corpuscles is filled throughout with calcareous salts, indeed so uniformly that no interval can be perceived between the individual particles. Some writers have assumed, however, that little granules can be distinguished in them, but this is an error. The only variation which can be seen is caused by the prolongation into the basis substance of the canaliculi, which all ultimately lead back to the bone corpuscles, and in their turn give out branches. The peripheral extremities of these little branches extend right up to the surface of the vascular canal. They are therefore inserted exactly where the membrane of the vessel begins, for they can be distinctly perceived as very minute orifices upon the wall of the canal. Now since the different bone corpuscles are distinctly connected with one another, means are afforded by which a certain quantity of juice taken up from the surface of the vascular canal is not diffused throughout the whole mass of tissue, but confined to these channels, and forced to move onwards in canals which are inaccessible to injections from the vessel. For a time it was believed that the canaliculi ossei (bone canals,) could be injected from the vessel, but this is only possible when the vascular canal has become empty by maceration. This is a condition precisely similar to what we observe in the *teeth*, in which the canaliculi can be injected from the bulk

cavity when empty. If a solution of carmine be injected into this cavity, the dental canaliculi are displayed in the form of numerous tubules running up to the surface side by side in a radiated manner. The substance of the teeth also forms a tolerably broad layer of non-vascular material. Vessels are found only in the pulp-cavity, in proceeding outwards from this, we find nothing but the proper substance of the teeth (dentine) with its system of tubes, which extend nearly up to the surface, and in the root of the tooth are continuous with a layer of real bony substance (cement,) the corpuscles of which are seated upon the ends of the tubes. A provision for the conveyance of the juices similar to that which in bone originates in the marrow, here takes its rise in the pulp, whence the nutritive fluid can be conveyed up to the surface by the means of tubes. These systems of tubes which are found in such a marked form in *bone* and in the *teeth*, are seen far less distinctly in the soft structures: they are distinguished in parts which are more of a cartilaginous nature. We find a series of transitional forms between cartilage and the other connecting tissues, in which the same conditions are constantly repeated. In the first place, parts which chemically belong to the class of cartilages, for example the cornea, which yields chondrine when boiled, although no one regards it as real cartilage. The arrangement is, however, more striking in those parts in which the external appearance speaks in favor of a cartilaginous nature; but the chemical properties do not correspond, as, for example, in the semi-lunar cartilages of the knee joint, which are interposed between the femur and tibia for the purpose of protecting the articular cartilages from too violent contact. These parts, which even now are generally described as cartilage, yield no chondrine on boiling, but gelatine; and yet in this hard connecting tissue, we meet with the same system of anastomosing corpuscles that prevails in the cornea and fibro-cartilage, and it is displayed in great distinctness. Vessels are almost entirely wanting, but in exchange these cartilages contain a system of tubes of rare beauty. In these cartilages the whole mass of tissue is only connected by its exterior with the circulatory system: every thing that penetrates into the interior must pass through a system of canals with numerous anastomoses, and the nutrition of the internal parts is dependent upon this mode of conveyance, and therefore we have in them to deal

much more than in cartilage, with such an arrangement for the supply of nutritive juices as cannot be under the direct control of the vessels.

On the surface of a tendon we see with the naked eye, a series of parallel whitish striæ which run closely together in a longitudinal direction. By a magnifying power an internal arrangement is shown, nearly corresponding to that in the semi-lunar cartilages. Externally the tendon is invested by a fibrous mass, in which the vessels are contained that are entwined around it. From these at different points vessels proceed into the interior, where they are to be seen in the larger partitions which separate the fasciculi; but in the interior of the fasciculi no trace of a vessel can be seen, but here we again meet with the peculiar system of nutritive conveying canals. Tendons may therefore be divided into larger (primary) bundles, and these in their turn into a certain number of smaller (secondary) fasciculi, which are separated by broad bands of a fibrous substance containing vessels and fibre-cells, so that a transverse section of a tendon presents a meshed appearance. From this intervening substance, stellate cells pass into the interior of the fasciculi, which anastomose with one another, and establish a communication between the external vascular and the internal non-vascular parts of the fasciculi. This relation is more evident in the tendons of children, than those of adults. The older the parts become, the larger and finer are the processes of the cells, so that in many sections we do not meet with the real bodies, but only minute specks, which by altering the focus, may be traced into filaments, or point-like orifices; as the individual cells become more separated, it is more difficult to obtain a whole view of the cell at once. In a longitudinal section, spindle-shaped cells will be seen, in a transverse one, stellate, and the network of cells displayed in the transverse sections corresponds to the regular succession of spindle-shaped corpuscles arranged in rows, which are seen in a longitudinal section, entirely in correspondence with the plan in connecting tissue. The natural divisions of the tendon are entirely symmetrical, so that an equally large quantity of intercellular substance falls to the share of every cellular element, and as the cell networks in the interior can be directly traced into the dense bundles of cells of the septa, and these in their turn up to the vessels,

we may regard these reticulating cells as the channels for the transmission of this intermediate current of nutritive juice, which has no communication by means of orifices with the general circulation.

In the same way that tendons have their peripheral system of vessels, and their internal parts nourished by a delicate juice-conveying system of tubes, so also in the *cornea*, only the most minute vessels extend a few lines over its border, so that the central parts are completely destitute of vessels, as indeed they are obliged to be, in order to allow of the transparency of the tissue.

The substance of the umbilical cord is also formed by one of those tissues which certainly contain vessels, and yet really possess none. The vessels which are transmitted through the umbilical cord, do not immediately contribute to its nourishment, at least not in the sense of which we speak of nutrient vessels in other parts; for when we allude to nutrient vessels, we mean those which have capillaries in the parts which are to be nourished. Therefore we should expect, in the case of the umbilical cord, to find umbilical capillaries, in addition to the two umbilical arteries and the umbilical vein. But these arteries do not ramify until they reach the placenta. The only capillary vessels in the whole length of the umbilical cord of a somewhat developed fœtus do not extend more than four or five lines beyond the abdominal walls into that part of the cord which remains after birth. The farther up this vascular part extends, the greater the development of the navel. The capillaries mark the limits of the permanent tissue; the deciduous portion of the cord has no vessels of its own. In a transverse section of the umbilical cord it may be observed that the thick muscular coat is composed of smooth muscular fibres, lying in contact with one another, and in such abundance as is scarcely to be seen in any completely developed vessel. This peculiarity explains the extraordinarily great contractility of the umbilical vessels. Sometimes, upon the application of external stimuli, they contract to such a degree that their canal is entirely closed, and thus, after birth, and even without application of a ligature, as when, for example, the umbilical cord has been torn asunder, the bleeding may stop of itself. The thickness of the walls of these vessels is therefore easily comprehended; for in addition to the thick muscular coat, there is another before we come to the gelatinous, jelly-like tissue (mucous tissue)

of the umbilical cord. This jelly-like tissue is a well constructed one of a typical form, and that which constitutes the jelly in the more restricted sense of the term, is the expressible part of the intercellular substance, after the removal of which there remains a tissue containing a delicate network of anastomosing cellular elements, by means of which a uniform distribution of the nutritive juices is rendered throughout the whole substance of the umbilical cord. A structure bearing great resemblance to the external layers of the cornea, is exhibited by a section through the external layers of the umbilical cord; first an epidermoidal stratum, beneath it a somewhat denser dermoid layer, and then the Whartonian jelly, which corresponds in texture to the subcutaneous tissue.

Cellular tissue, also belongs to the series of connective tissues. This substance fills up the interstices in the different organs, in greater or less quantity, and thus facilitates the gliding of parts one upon the other. The elastic fibres in this tissue are arranged and distributed in the same way as the cells and cell-tubules of connecting tissue. In this transformation of the corpuscles of connecting tissue into elastic fibres, (nothing more than a condensation and thickening,) a chemical metamorphosis of the membrane takes place, but ultimately, however, a very small portion of the cell-cavity remains. This transformation prevails to a great extent in the skin, in certain parts of the middle coats of arteries, particularly in the aorta. Here the network of elastic fibres attains such a preponderance, that it is only with great care that minute cellular elements can here and there be detected. In the *skin*, in addition to the elastic fibres, a somewhat greater number of small corpuscles are found which lie in the interstices of the large meshed networks, where they either form a system with perfect anastomoses and small meshes, or else appear in the shape of mere isolated roundish bodies. This is especially the case in the papillary portion of the skin.

Arteries.—The walls of the arteries are relatively very thick, and in those which can be followed by the naked eye, not only the well-known three coats, but also, a fine epithelial layer which invests the internal surface, are distinguished by the microscope. The internal and external coats are formed of connecting tissues, which in the larger arteries display a quantity of elastic fibres; between them

lies the circular fibre coat, the seat of the muscular fibres. These fibres are found in the greatest abundance in the middle-sized and smaller arteries; whilst in the larger ones, especially in the aorta, elastic layers form the predominant constituent even of the circular-fibre coat. In small arteries on microscopical examination, there may be observed within this coat, little transverse striations, encircling the vessel in such dense array that we find fibre-cell by the side of fibre-cell without any interruption. The circular fibre coat distinguishes the arteries most clearly from the veins, and whenever we meet with such a structure we may assume the vessel to be arterial. These vessels, which must be included among the larger ones, although even when full of blood they only appear to the naked eye like red filaments, pass gradually into smaller ones, and with a power magnifying three hundred diameters, we see them breaking up into branches, into which, even when they are very small, the three coats are at first continued.* It is only in the smallest branches that the muscular coat finally disappears, the intervals between the individual transverse fibres becoming wider, and the internal coat at the same time appearing more and more distinctly through it. The external coat also may be followed for a short distance farther, till at last it also becomes lost to view, and only a simple capillary remains. The general supposition, therefore, is that the proper capillary membrane most nearly corresponds to the internal coat of the larger vessels, and it is usually considered that the more complete a vessel becomes, the greater is the number of the coats which develop themselves around it. The nuclei of the capillary vessels correspond to the longitudinal axis of the vessel, and are so imbedded in its membrane that it is impossible to discover any traces of a surrounding cell-wall. After the capillaries have pursued their course for a time, small veins begin gradually to form out of them, and generally run back in the neighborhood of the arteries. The characteristic circular fibre coat of the arteries is generally wanting in them; but in its place we find toughish layers abounding in elastic elements, which run in a longitudinal direction, and are found in greater or less quantity in different localities. In an inward direction there follow next the softer and more delicate layers of connecting tissue of the internal coat, and on this is found a flat, extremely translucent layer of epithelium, which generally

protrudes out of the cut end of the vessel, thus giving the impression of spindle-shaped cells.

When an artery is acted upon by any influence which causes a contraction of its muscular tissue, it becomes narrower, inasmuch as the contractile cells lie in rings around the vessel: this contraction may, under certain circumstances, proceed, until the canal is almost entirely obliterated, and the natural consequence is, that less blood penetrates into the corresponding part of the body. The muscular fibres of a vessel contract upon the application of every stimulus which sets them in action; but this contraction is confined to the spot irritated, or, at most, extends a little beyond, and continues for a certain length of time at this spot. The more muscular the vessel is, the more lasting and forcible the contraction, and the greater is the obstruction experienced by the current of blood. The smaller the vessels, on the contrary, do we see the contraction succeeded by a dilatation, which, however, is not in its turn followed by a contraction, as would be necessary to constitute a pulsation, but persists for a longer or shorter time. This dilatation is not of an active, but of a passive nature, and results from the pressure of the blood upon the wall of the vessel which has become fatigued, and opposes less resistance.

Hyperæmia.—When an artery is really in action, it gives rise to no hyperæmia, and the less or greater degree of activity in it, determines the greater or less quantity of blood which in a unit of time can stream into a given part. *The more active the vessel, the less the supply of blood.* If then, we deal with an hyperæmia, the result of irritation, the most important point is to place the vessels in such a state of activity, as will enable them to offer resistance to the onward rush of blood. This we can accomplish by counter-irritation, by means of which the fatigued muscular fibres of the vessel are stimulated to persistent contraction, thereby diminishing the supply of blood, and leading the way to a regulation of the disturbance. When reaction is necessary, the chief point is to overcome that state of passiveness which maintains the hyperæmia. If we now pass from the muscular to the elastic constituents of the vessels, we meet with a property which is of very great importance, on the one hand in the veins, the activity of which is in many cases to be wholly referred to their elastic elements; on the other, in the

arteries, particularly in the aorta and its larger branches. In these, the elasticity of the walls has the effect of compensating for the loss which the pressure of the blood experiences from the systolic dilatation of the vessels, and of converting the uneven current produced by the jerking movements of the heart into an even one. If the elasticity of the vessel be considerably diminished, without its becoming stiff and immovable in the same degree, the dilatation which it undergoes from the pressure of the blood is not again compensated; the vessel remains in a dilated condition, and thus are gradually produced the well-known forms of enlargements, such as we are familiar with in the arteries under the name of aneurisms, and in the veins under that of varices.

The greater or less quantity of blood which flows through a part, is not to be regarded as the cause of the changes in its nutrition. When a part which is in a state of irritation, receives more blood than usual, it is able to attract a larger quantity of material from the blood with greater readiness, than it otherwise would have done, or than it would have been able to do if the vessels were in a state of contraction, or less filled with it. It is not so much an increase of quantity, either in the blood as a whole, or in that portion of it contained in an individual part, which is required in order that a like increase should forthwith take place in the nutrition of that part, or of the whole body, as that, in my opinion, particular conditions should obtain in the tissues, (irritation) altering the nature of their attraction for the constituents of the blood, or that particular matters should be present in the blood, (specific substances) upon which definite parts of the tissues are able to exercise a particular attraction. Essential conditions in these cases are, that the parts which are believed to have a particular elective affinity for particular matters, should *really* exist, and that they should possess a relation of affinity. An hepatic cell can attract certain substances from the blood which flows through the nearest capillary vessel; but it must, in the first place, exist, and in the next, be in the enjoyment of its special properties, in order to exercise this attraction. If the living element become altered, or a disease occur, then its power of exercising this special attraction will, at the same time, be impaired.

Fibrine, one of the constituents of the blood, owing to its coagu-

lability, assumes a visible form as soon as the blood is removed from the body; and, for this reason, it has frequently passed for a morphological constituent. This dissociation of fibrine from the other fluid constituents of the blood, is of real value; because it, like the blood-corpuscles, is quite a peculiar substance, and so exclusively confined to the blood and the most closely allied juices, that it really may be viewed as connected rather with the blood-corpuscles, than with the mere fluids which circulate as serum. If we consider the blood in its really specific constituents, it cannot be denied that the corpuscles, with their hæmatine, and the fibrine of the liquor sanguinis, are the elements in which we must seek for the morbid changes. On examining fibrine, as it appears in blood-coagula, it is generally found in the fibrillar form. Its fibres form extremely fine interlacing, delicate networks, in which they usually cross and join one another in a somewhat tortuous direction. There is always present, in a clot, a network, composed of fibres, in the meshes of which the blood-corpuscles are enclosed. If a drop of blood be allowed to coagulate, fine filaments of fibrine can be seen every where shooting up between the blood-corpuscles. As to the nature of these fibres, there are only two substances, which, histologically speaking, bear a near resemblance to them, namely, *mucus*, and *connecting tissue*.

Red Blood Corpuscles.—An ordinary red blood corpuscle is composed of a closed membrane, containing a tolerably tough mass, which is the seat of color. They are flattened, disc or plate-shaped bodies, with a central depression on each surface, and, when regular in form, constitute, as it were, a ring, in the centre of which the color is fainter from the diminished thickness. The contents are composed of *hæmatine*, or the coloring matter of the blood. Besides this, there are other matters contained within the blood-corpuscle, which belong entirely to its chemistry. We observe that the blood-corpuscles, accordingly as they imbibe oxygen, or contain carbonic acid, appear light or dark, while they alter their form a little. We know, farther, that by the action of chemical fluids, certain quantities of water are abstracted from the corpuscles, and that they then shrivel, and experience peculiar changes, which might very easily give rise to errors. The substances contained in the blood-corpuscles have recently become invested with great interest,

owing to the peculiar forms of colored crystals, which can, under certain circumstances, be obtained from hæmatine. We have already become acquainted with three different kinds of crystals

Hæmatoidine, is one of the most frequent of metamorphic products. In its perfect form, it presents itself in the shape of oblique rhombic columns, and is generally of a beautiful yellowish-red color,—or when in thicker pieces of a deep ruby-red, and constitutes one of the most beautiful crystals with which we are acquainted. This substance may be considered as the regular, typical, ultimate form, into which hæmatine is converted, in any part of the body where large masses of blood continue to lie for any length of time. An apoplectic effusion in the brain, for example, cannot be removed by any other process than by a large portion of the blood undergoing this form of crystallization; and if we afterwards find a colored cicatrix at the spot, we may feel perfectly assured that the color is dependent upon the presence of hæmatoidine.

Hæmatoidine has another special claim to our interest, as it is the only substance in the body, at least, that we are acquainted with as yet, which is allied to the coloring matter of the bile. This circumstance derives its especial interest from its being supposed, that the colored constituents of the bile are products of the decomposition of the red coloring matter of the blood. In the interior of extravasations, there really does arise a yellowish-red substance, which may be designated as a newly formed kind of biliary coloring matter.

Hæmine, the second kind of crystals which arises out of hæmatine, are very similar to the preceding ones, but differ from them, as they do not occur as a spontaneous product in the body, but must be artificially produced. They are more of a dark-brownish color, and usually form flat rhomboid plates, with more acute angles, they are, in an extraordinary degree, capable of resisting tests, and also do not, when acted upon by the mineral acids, exhibit the peculiar play of colors afforded by hæmatoidine.

Hæmato-Crystalline.—The third substance which belongs to this series, is the so-called Hæmato-Crystalline, a substance about the discovery of which the learned still dispute, for the simple reason that it was found out piecemeal. The first observation concerning it was made by Reichert, in extravasations in the uterus of the Gui-

nea-pig. Afterwards, these crystals were again discovered by Kolliker; but Funke, Kunde, and especially Lehmann, have examined them more closely. The result is, that they are found to be very different in different animals; in man they are tolerably large. They are very easily destroyed, both when they dry up and when they become moist; or when brought into contact with any fluid medium, they perish, and are therefore only observed in certain transitional stages, which must be exactly hit upon in the destruction of blood-corpuscles. The well-developed forms in man are perfectly rectangular; but, very frequently, they are extremely small, and nothing is seen but simple spiculæ, which shoot up into the object at certain spots, in large masses. There is, besides, this peculiarity about them: they retain the property, which hæmatine itself has, of becoming bright-red with oxygen, and dark-red with carbonic acid.

Colorless Blood-Corpuscles.—These are present, in comparatively small quantity, in the blood of a healthy man. To three hundred red corpuscles, we reckon about one colorless one. In a drop of blood which has become quiet, the red corpuscles are usually found aggregated in rows, presenting the familiar form of rouleaux of money, with their flat discs one against the other: in the interspaces, here and there may be observed one of those pale, spherical bodies, in which, when the blood is quite fresh, nothing more can be distinguished than an occasionally slightly granular-looking surface. If water be added, the colorless corpuscles swell, and in proportion as they absorb the water, a membrane becomes distinct; then granular contents gradually come into view, with more and more clearness, and at last some indication is perceived of the presence of one or several nuclei. These corpuscles are possessed with the peculiar property of being sticky, so that they readily adhere to one another; and, under certain circumstances, cling also to other parts. When there is an actual increase in the number of colorless cells in the blood, it is very common for agglutinations to take place among them, as soon as the pressure, under which the blood flows, is diminished. This adhesiveness also causes the colorless corpuscles to move more slowly than the red ones.

Lymph.—Lymph is the fluid which, while it conveys elementary substances to the blood, at the same time contains molecular plasma,

from which the blood-corpuscles are continually developed. The fibrine, which circulates in lymph, differs in certain respects from that contained in the blood. It has this special peculiarity, that under ordinary circumstances it does not coagulate within the lymphatic vessel, during life nor after death; whilst blood, in many instances, coagulates even during life, and regularly does so after death. The explanation of this peculiarity has been attempted in different ways. But, for my own part, I must still adhere to the view, that there is no perfectly-developed fibrine contained in lymph, but that it becomes perfect, either by contact with the atmospheric air, or in abnormal conditions by the introduction of altered matters in it. Normal lymph contains a substance, which is very easily converted into fibrine, and, when it has once coagulated, is scarcely distinguished from it, but which, as long as it continues to circulate, cannot be regarded as really perfect fibrine. This substance occurs in pleuritic fluids, and also in the blood of the peripheral veins; so that even by an ordinary venesection performed on the arm, blood may be obtained, distinguished from ordinary blood by the slowness of its coagulation. This coagulative substance is termed by Polli, *brady-fibrine*. Such cases occur especially in inflammatory diseases of the respiratory organs, and most frequently give rise to the formation of a buffy coat, (crusta pleuritis, crusta phlogistica.) Now, since phenomena of this kind are observed to occur in chest affections, there would seem to be grounds for inferring, that respiration has a definite influence upon the occurrence or non-occurrence of the fibrinogenous substances in the blood. At all events, the peculiarity possessed by the lymph is, under certain circumstances, transmitted to the blood, and the less the tendency to coagulation, the greater the difficulty of respiration. Sometimes two sorts of coagulation occur side by side in the same blood, especially in the cases in which direct analysis shows an increase of fibrine, a *hyperinosis*. This may be explained by the fact that *fibrine*, whenever it occurs in the body external to the blood, is not to be regarded as an excretion from the blood, but as a local production. Certain tissues and organs have inherent powers in a higher degree for producing fibrine, and of favoring its occurrence in large quantities in the blood, whilst other organs are far less adapted to its production. It is a well-ascertained fact, that fibrine can only exude

upon a surface by the occurrence of some irritation, that is, local change, in addition to the disturbance in the circulation. This change is sufficient to cause the exudation of fibrine, even when no obstruction arises in the circulation. Such obstruction is not, therefore, in any way needed, in order that the production of fibrine may commence at any given point. On the contrary, we see that the cause of the greatest difference in the nature of exudation, is to be found in the special constitution of the irritated parts. It is *very rarely that a considerable increase of fibrine takes place without a simultaneous increase in the colorless blood-corpuscles;* and that, therefore, the two essential constituents which we find in the lymph, we again meet with in the blood.

Leukæmia.—This morbid state consists in an increase of white corpuscles, and a decided decrease of the red ones. This abnormal condition exists in connection with hypertrophy of the spleen, or of the liver, and with various affections of the lymphatic glands. The *spleen*, however, forms the chief object of the complaints and distress of the patients.

Glands.—When a gland is cut across, a structure is frequently brought to view resembling that of a kidney. Where the afferent vessels break up, a firmer substance is seen to lie, half surrounded, by which a kind of hilus marks the spot at which the lymphatic vessels again forsake the gland. Here there is found a reticular tissue, into which, besides the afferent lymphatic vessels, blood-vessels also enter on their way into the proper substance of the gland. The essential part is, therefore, the periphery, the often kidney-like cortical substance. In this can be distinguished, whenever the gland is at all well developed, little, roundish, white, or gray granules, lying side by side. A red circle of vessels is nearly always discerned around each granule, when the part is moderately well filled with blood. These granules are composed of little cellular elements, which are variously intersected by a trabecular network. It seems, therefore, that the current of lymph forces its way between these elements, and that no free channel for it exists, seeing that the elements lie crowded together, so that the lymph trickles out again on the other side, in a more or less purified state. Of the minute elements contained in the follicles, the cells of the parenchyma soon appear to become separated, and to mingle with the

blood as colorless blood, or lymph-corpuscles. The more the glands become enlarged, the more numerous are the cellular elements which pass into the blood, and the larger and more perfectly developed are the individual colorless cells of the blood wont to be.

Pyæmia.—By *pyæmia*, is meant that condition in which pus-corpuscles are supposed to be in the blood. It was formerly imagined that the constituents of pus pre-existed in the blood—that it was only a kind of secretion from the blood, and that it might be again taken up from the different points at which it had been deposited, and that a favorable turn was thereby effected in the disease, inasmuch as the re-absorbed pus was thus at last removed from the body.

Pus, however, *as pus*, is never re-absorbed. There is no form, by which pus, in substance, can disappear by the way of re-absorption; it is always the fluid part which is taken up, and therefore what is termed the re-absorption of pus may be inferred from the two following impossibilities:—In the first place, the pus, with its corpuscles, is, at the time of re-absorption, still more or less intact, and becomes thicker in proportion as the fluid disappears. This constitutes the long-known *thickening* (inspissation) of pus, which consists of a thick mass, containing the pus-corpuscles in a shrivelled condition, as not only the fluid between them, but that which they contain has disappeared. Pus consists essentially of corpuscles lying closely to one another, between which a small quantity of intercellular fluid exists. Within the pus-corpuscles lies a substance, which likewise is provided with a great quantity of water. When then, re-absorption takes place, the greatest part of the intercellular fluid first disappears, and the pus-corpuscles draw nearer to one another, soon, however, a part of the fluid from the corpuscles vanishes, and in proportion as this is the case, they become smaller, more irregular, angular, and uneven.

The second form of purulent re-absorption is that which constitutes the most favorable case, when the pus really disappears, and no essential part of it remains. But here, also, the pus is not re-absorbed as pus, but first undergoes a fatty metamorphosis; every cell, with its fatty particles within it, breaks up, and at last nothing remains except fatty granules and intervening fluid. Cells and pus no longer exist, but their place is occupied by an

emulsive mass, a kind of milk, composed of water, some albuminous matter and fat.

There is one case, in which pus may become the object, not exactly of a re-absorption, but of an *intravasation*, and where this intravasated pus may circulate within the vessels, namely, when a vessel receives a wound, or is perforated, and pus passes through the opening into its interior, or an abscess may lie close to a vein, burst through the walls, and evacuate its contents into the vessel. Still more easily can such a transit be effected in lymphatic vessels, which run into open abscesses. All the lymphatic vessels which are in a condition to take up pus in this way are peripheral ones, whether they arise from external or internal parts, and only after a somewhat lengthened course do they gradually reach the blood-vessels. In all, interruptions are formed by the lymphatic glands; and since we know that the lymphatic vessels do not pass through the glands as wide, tortuous, and interlacing canals, but that, after they have broken up into fine branches, enter into spaces which are filled with cellular elements, it is manifest that no pus-corpuscle can pass a gland. The lymphatic vessels are often very severely injured by rubbing, a practice which is very common among the Hydropathists.

Lymphatic Glands in Cancer and Syphilis.—When an axillary gland becomes cancerous, and when during a long period it only remains diseased without the glands or other organs becoming affected, it can only be accounted for on the supposition that the gland collects the cancer cells, thus affording protection to the body for a time, but at length proving insufficient, and becoming a new source of independent infection. Equally instructive examples are afforded in *syphilis*, in which a bubo may for a time become the depository of the poison, the rest of the economy being affected in a comparatively trifling degree, until the glands become overcharged, and distribute their contents to surrounding tissues.

Lymphoid Organs.—In addition to the well-known ordinary lymphatic glands, a great number of smaller apparatus exist in the body which possess precisely the same structure, but do not exhibit so complex an arrangement. To this class belong all the *follicles of the in-*

testines, both solitary and the Peyerina, the follicles of the *root* of the *tongue*, the *tonsils*, the *thymus gland*, and the *Malpighian or white bodies*, a very essential constituent of the *spleen*.

The Blood.—The blood is that fluid which circulates in the elastic tubes, constituting from one-fifth to one-seventh of the entire weight of the body. It is a thick fluid, of the specific gravity of 1.056, generally of a bright cherry red in the arteries, but much darker in the veins. Microscopically examined, it will be seen to be composed of a great number of yellow corpuscles, swimming in a colorless fluid. The corpuscles in man are either circular or elliptical, and invariably flattened. There may be also observed a number of colorless ones, more spherical and larger and having a granular surface. Globules of oil and granular matter may be observed when the blood is diseased. Its component parts consist of colored and colorless corpuscles, fibrin, albumen, and saline matter. The latter is composed of sulphur, potassium, phosphorus, lime, magnesia, iron and sodium. The fluid portion constitutes the liquor sanguinus, and is a solution of fibrin, albumen and salts, suspending the white and red corpuscles. Of the formation of blood, especially of the blood corpuscles, there has been much patient and careful research. Simons regards the development of blood corpuscles as emanating from lymph granules, and intimates that this metamorphosis of the lymphatic corpuscles, is produced by some vital influence of the lymphatic glands, but that these corpuscles are not perfected until they pass through the lungs. Bennett, on the other hand, regards the lymphatic ganglia, spleen, suprarenal capsules, thymus and thyroid glands as the essential blood manufacturing apparatus, and that in these glands, colorless nuclei and cells are formed from the plasma or chyle which is generated from nutriment. The following experiment by Bennett would seem to substantiate this position:—A rabbit was killed, three hours after having taken a meal. The thorax was rapidly opened, and a ligature placed around the pulmonary artery, to prevent the corpuscles coming from the thoracic duct, passing into the lungs. The abdomen was then pressed gently for a few minutes, to favor the flow of chyle, and then a ligature placed around the large vessels, and the heart removed by cutting above it. On examining the blood in the right ventricle, it presented an unusually large number of color-

less cells, the nuclei of which, on the addition of acetic acid, exhibited all the transitional stages. The colorless cells were found normal in amount in the left ventricle. The experiment was repeated with the same results. There are two theories respecting the development of these corpuscles in the blood glands; one is, that they are thrown off from the glands in the form of epithelial germs, which eventually are changed into blood corpuscles. The other is, that they are generated in the organic fluid by the production of molecules, the successive development and aggregation of which constitute the higher formations.

The pathological changes which occur in the blood, according to Andral, Simon, Gavarret, and Rodier.—Venesection impoverishes the blood, by increasing the water, diminishing the albumen and corpuscles. In plethora there is no change in the constituents of the blood, but an increase in its bulk. The fibrine and cholesterine are increased in inflammation, and the albumen diminished. The fibrine is diminished in exanthematous fevers, intoxication, purpura hemorrhagica. When any of the secretions are checked, their essential constituents are found in the blood. In Bright's disease, purpura and dropsy, the albumen is materially diminished. In tuberculous phthisis, after the tubercles commence to soften, the fibrine is increased, and the red corpuscles rapidly diminished; the salts of the blood are also deficient. In cancerous affections, fatty globules are found in the blood, and tuberculous granules, in consumption and scrofula.

The Nervous System.—The great mass of the nervous system consists of *fibrous constituents.* Our knowledge is, for the most part, confined to the *white substance*, the fibrous portion, and we are still involved in the greatest uncertainty with regard to the gray or ganglionic tissue, which, as far as its functions are concerned, manifestly holds a much higher position. If we exclude the gray substance, and confine ourselves simply to the fibrous matter, we have, on the other hand, the real (peripheral) *nerves*, in the narrower sense of the word, and on the other, the large accumulations of *white medullary substance*, of which the greater part of the cerebrum, cerebellum, and the columns of the spinal marrow are composed. The nerves contain a certain number of fasciculi, which afterwards separate in the form of branches or twigs. The nerve, under nearly all

circumstances, retains a fascicular arrangement until near its ultimate divisions; so that every fasciculus in its turn comprises a greater or less number of so-called primitive fibres. The term *primitive fibre* here employed, is selected because a nerve-fasciculus is regarded by some as analogous to the primitive fasciculus of a muscle. This notion, however, at present is almost obsolete, and Robin was the first who, in more recent times, directed attention to the substance which holds the fasciculus together, and which he calls *perineurium*. It consists of very dense connecting tissue, containing small nuclei, and is different from the looser structure which in its turn holds the fasciculi together, and constitutes the so-called *neurilemma*. Within these membranous tubes lie the proper *nerve-contents*, which ordinarily may be divided into constituents of two descriptions. In the interior of the nerve fibre, the so-called axis-cylinder occurs, and around it there is a tolerably firm, dark mass, (the *nerve-medulla or medullary sheath*) which fills up the space between the axis-cylinder and the external membrane.

The so-called *nerve-medulla* gives the nerve fibres, in general, their white appearance; whenever it is wanting, they appear translucent and gray. The absence of medulla, stamps it as one of a lower and more imperfect kind, whilst its presence announces a more abundant nutrition and a higher development of the part.

The *white substance* prevails the most extensively in the animal body. There scarcely exists a tissue, rich in cells, in which it does not occur in large quantity; yet it is only in the nerve fibre that the substance separates as such, whilst in all other cellular parts it is contained in a finely divided state, in the interior of the cells, and is only set free when the contents undergo a chemical change, or are subjected to the action of chemical agents. This structure, which is termed the *medullary matter*, fills up the interval between the axis-cylinder and the sheath in primitive fibres. When the nutrition of a nerve suffers disturbance, this substance diminishes in quantity, and may even disappear entirely, so that a white nerve may again be reduced to the condition of a gray or gelatinous one. This constitutes *gelatinous degeneration*, in which the nerve-fibre in itself continues to exist, and only the peculiar accumulation of medullary matter has been affected. The peculiar nature of the medullary matter most frequently displays itself in this way;—when a nerve is

torn across or cut, the medulla usually protrudes from it, presenting, especially after it has been acted upon by water, a peculiar striated appearance. The longer the action of the water lasts, the longer are the masses which protrude from the nerve. They have a peculiar, ribbon-like appearance, keep continually acquiring new streaks and layers, and give rise to the most singular shapes.

The nerves are distinguished by the breadth of their primitive fibres, and by the presence of medulla. We have very broad, middling-sized and small white fibres, and broad and fine gray ones. The gray, very seldom attain a great size, because the size of a nerve depends more upon the greater or less quantity of medulla it contains, than upon the volume of the axis-cylinder; but still variations present themselves every where, so that some are coarser and others finer. The primitive fibres usually become finer in the terminal portions of nerves. The ordinary peripheral nerves are abundantly provided with broad fibres; the sympathetic contain a comparatively larger portion of fine ones. The most manifest form of termination is in the *pacinian or vaterian bodies*. These are most marked in the adipose tissue of the ends of the fingers, but also in tolerably large numbers, at the root of the mesentery. A pacinian body is of a whitish color, usually oval and somewhat pointed at one end, and firmly attached to a nerve, in such a way that a single primitive fibre passes into each body. It presents a comparatively large number of elliptical and concentrical layers, which, in the upper end, are in close contact, but at the other, are separated by a wider interval, and enclose in their interior an oblong space, generally somewhat more pointed towards the upper end. Nuclei lie within these layers, which finally pass into the *perineurium*, and may therefore be regarded as gigantic developments, enclosing only a single nerve fibre. The medullated portion of a nerve fibre extends only up to the beginning of the body, and the axis-cylinder continues its course alone. It then runs on through the central cavity, and terminates either in a little bulbous swelling, or in a spiral coil. We are yet entirely ignorant as to the office which these bodies perform.

A certain degree of resemblance to these structures is exhibited by the *tactile bodies*. A tactile body manifests itself as an oblong oval structure, and is tolerably distinctly marked from the remainder of the papillæ. It does not exhibit a longitudinal striation, as the

pacinian bodies, but *transverse nuclei.* In every one of them, we usually see two nervous filaments, pretty close to one another, which can easily be traced up to the side or the base of the body. After this point their course is very doubtful; sometimes the nerve is very distinctly seen to ascend and intwine itself around the body; again it seems as if the body lay in a nervous loop; at other times it looks as if the nerve came to a termination much sooner, and buried itself in the body. The only point which seems doubtful is whether the nerve ends in a body, or forms a loop around it. This example is of great value in the interpretation of pathological phenomena, because we find here two complete contrasts in parts which in themselves are quite analogous; for, on the one hand, we have nerveless, but vascular—and, on the other, non-vascular, papillæ, yet provided with nerves. If we imagine the vessels and tactile bodies removed, there remains only a very small quantity of substance in the papillæ; but within it there are still morphological elements, and it is easy to convince ourselves that connecting tissue, with its corpuscles, is in immediate contact with the cells of the rete mucosum. If we divide the skin into definite territories, those pertaining to the nerves will be larger than those belonging to the vessels. But every vessel territory (papilla) which is marked out by a single capillary loop, is divided into a series of smaller sections, which lie along the sides of the same vessel, but yet have an independent existence, each of them being provided with a special cellular element. We again direct attention to the termination of nerves. They either terminate in a plexus or reticular expansion, or in special apparatus, and constitute peculiar structures, non-nervous in their nature, to which they attach themselves. This last mode is characteristic of most of the *higher organs of sense;* but in no single instance, owing to the great difficulty which the investigation of these parts presents, have any views been proposed which have met with universal assent. According to some, their terminations are connected with special structures, as, for example, in the nasal mucous membrane. This is clothed with cylindrical epithelium, which is plentifully provided with cilia, and forms several layers, lying one above the other, so that there are several rows of cells covering one another. In these, according to some, cells are met with, which terminate in a somewhat long filament,

and run in an inward direction, so as to become directly continuous with the ends of the nerves. According to others, and this view seems to be the more correct one, peculiar filiform ends of nerves force their way out between the epithelium. The objects of smell would, therefore, according to both views, really come in direct contact with the structures forming the terminations of the nerves. Similar epithelial-like structures have recently been described as occurring also in the mucous membrane of the tongue. These structures bear a certain resemblance to the termination of the optic nerve in the retina, and that of the auditory nerve, especially in the cochlea.

There yet remains one more mode to be mentioned of the terminations of nerves. We are at the present time acquainted with most extensive arrangements with regard to *nervous plexuses*, as, for example, in the submucous tissue of the intestines. This tissue is a nervous tunic. On following up the different nerves, they are seen, after having divided, breaking up into real net-works; these, in newborn infants, present, at certain points, very large nodules, from which the nerve fibres spread out into interlacements. These plexiform expansions are by no means simple; the large nodules have the appearance of ganglions, so that we have here, in some sort, new nervous centres presenting themselves. The ganglion cells predominate in those parts of the nervous centres in which there is gray matter. This matter is not a decisive proof of its ganglionic nature, and we must not suppose that the ganglionic cells are at all essentially concerned in the production of the gray color, as we find gray matter in many places where they do not exist. It frequently happens that where there are ganglion cells, the substance really does not look gray, but varies between brownish yellow and blackish brown. The older an individual becomes, the more conspicuously do the colors show themselves; still, under certain circumstances, pathological processes seem to accelerate their manifestation. Thus in the ganglia of the sympathetic it is a striking phenomenon, that certain morbid processes, for example, typhoid fever, appear to exercise a powerful influence in producing an early deposit of pigment. In such cases we discern in the ganglion cells, in addition to the very distinct, large nucleus, with its bright nucleolus, the contents consisting of a finely granular substance, and at

a certain spot enclosing the pigment, which is usually deposited eccentrically, but sometimes around the nucleus. Frequently this deposit increases to such an extent that a great part of the cell is filled with it.

By the investigations made into the structure of the spinal cord, it has been shown that all the processes of the individual ganglion cells do not become continuous with nerve-fibres, but that a part of them run to other cells, and thus establish a communication between them. The cord presents, in various parts of its course, a different amount of white matter, although nearly every where it predominates over the gray. Wherever, then, the substance appears white to the naked eye, it is essentially composed of real, medullated nerve-fibres, in which only here and there a few ganglion cells are imbedded; and, indeed, a large proportion of these fibres are of considerable breadth, so that the quantity of medullary matter is at certain points extremely large. It is in the centre of the gray substance that the *canalis spinalis* actually exists. This canal is so minute, that extremely successful sections are required in order that it may clearly be perceived. Usually, nothing more than a rounded gray spot can be detected. By microscopical examination we detect in it the transverse section of the canal, invested with a layer of epithelium. It is continued throughout the whole extent of the spinal marrow, from the *filum terminale* up to the fourth ventricle, where the orifice by which it opens into the so-called *sinus rhomboidalis* is situated in the gelatinous substance of the *calamus scriptorius*. As for the ganglion cells, they are generally found in the largest number in the interior and lateral parts of the anterior horns. In the white substance of the anterior, lateral, and posterior columns are found the medullated nerve fibres, following an ascending or descending course. The whole mass of fibres, constituting the columns of the spinal cord, is split up into a series of groups, following a radiating arrangement; sometimes they appear as wedge-shaped lobules, owing to the smaller or larger quantity of connecting tissue with which they are connected. The nerve fibres proceed throughout the whole length of the spinal marrow, and have their origin in the ganglion cells of the spinal nerves; they then decussate, and become lost in the anterior or posterior columns. With the help of these anatomical observations, we may form an idea of

the routes along which nerve forces are carried to the nervous centres. Well-defined peculiarities in the structure of the individual nervous centres correspond to the differences of function, the posterior horns become gradually more and more strongly developed as we ascend; and, in proportion as this development proceeds, we see the medulla oblongata, cerebellum and cerebrum coming into view, whilst the motor parts withdraw more and more into the background, and almost entirely disappear. It is very important to have a knowledge of that *substance*, also, which *lies between the proper nervous parts*, holds them together, and gives the whole its form in a greater or less degree. When the surface of any section of the ventricular wall is examined with a tolerably high power, the first thing noticed is an epithelium, in a better or worse state of preservation. In the most favorable cases, we find cylindrical epithelium with cilia, extending throughout the whole extent of the cavity of the spinal marrow, and of the brain. Beneath this follows a layer resembling connecting tissue. This layer has a white appearance, owing to the presence of medullated nerve fibres. If, now, we compare the substance which advances to the surface, with that which lies between the nerve fibres, no essential difference presents itself; on the contrary, it turns out that the superficial layer is nothing more than an extension upwards, beyond the nervous elements, of a portion of the interstitial tissue which is every where present between them, but in this layer alone is seen in all its purity. The larger cells which pervade the posterior horns of the spinal marrow are nerve cells; but, on the other hand, it must be admitted that where neuro-ganglia are met with, it must contain a certain number of cellular elements. Immediately beneath the surface of the cerebral ventricles we commonly meet with spindle-shaped cells lying parallel to it, just like those which are found in other kinds of connecting tissue; these becoming larger under certain circumstances, and in oblique sections, displaying themselves in the form of stellate shells. A substance, similar in structure to that in connecting tissue, is also found between the nerve fibres of the cerebrum, only the cells are so soft and fragile, that generally nothing but nuclei can be perceived, scattered at certain intervals throughout the mass. It is of considerable importance to know that in all nervous parts, in addition to the real ner-

vous elements, a second tissue exists, which is allied to the large group of formations which pervade the body. In considering the pathological or physiological conditions of the brain or spinal marrow, the first point is always to determine how far the tissue which is affected is nervous in its nature, or merely an interstitial substance. Within the neuro-ganglia run the vessels separated from the nervous substance by a slender intervening layer. The neuro-ganglia extends only to those parts which must be regarded as direct prolongations of the cerebral substance, to the higher nerves of sense. The olfactory and auditory nerves also contain interstitial substance of the same character, whilst in all the rest, and even in the optic nerve, an increasing mass of a tougher tissue displays itself, which assumes quite the character of perineurium. Perineurion and neuro-ganglia are therefore equivalent parts, the only difference being that the one is of a soft, medullary nature, while the other is akin to the well-known fibrous tissues. The neurilemma stands in the same relation to the perineurion, as the membranes of the brain and spinal cord do to the neuro-ganglia. Wherever neuro-ganglia exist, we meet with bodies whose structures remind us of granules of vegetable starch, *corpora amylacea.* They are found the most abundantly in the ependyma of the ventricles and spinal canal. They display themselves quite frequently in great numbers, when the quantity of neuro-ganglia is increased in proportion to that of nervous substance, as, for example, after *atropic processes.* In the cochlea and the retina, bodies occur, which are allied to the corpora amylacea, although the chemical tests have as yet only proved successful in the external ear.

We will now turn our attention to the *activity* and *irritability* of the *cellular elements*, and the *different forms* of irritation. When we speak of the life of the individual parts of a body, we must also know in what way life manifests itself, and how it is essentially characterized. This characteristic we find in *activity*, produced by a certain *excitation.* Every vital action pre-supposes an excitation, or an irritation. The *irritability* of a part is, therefore, the criterion by which we judge whether it be alive or not. When a given action is called into play, we have to deal with a manifestation, either of the *function*, the *nutrition*, or the *formation* of a point. In the case of a considerable number of tissues, we are able to say

but very little concerning their real functions, in the higher sense of the word, as, for example, in the connecting tissues and the majority of epithelial cells; but in those parts which are liable to a more rapid change, as the nerves, muscles, etc., the case is very different. In all these tissues we find that these functions are chiefly due to minute changes of place, in the small particles of the internal matter, the cell-contents. It is these contents, which, when exposed to certain influences, become comparatively rapidly changed, without our being always able morphologically to detect any deviation in the arrangement of the contained particles. The utmost that we can observe, is a real locomotion of small visible particles. If we watch a muscle during its contraction, we see that the intervals which separate the discs become shorter; and as we know that its substance consists of a number of small fibres containing little granules corresponding to these discs, we conclude that local changes really take place in the minutest elements, although they cannot be farther referred to any visible cause. In the case of ciliated epithelium, we see how the fine cilia, which are scattered upon the surface of the cells, move in a certain direction, exercising a locomotory effect upon the little particles which come near to them. These cells have at their upper end a border of a certain thickness, from which run out little hair-shaped prolongations. These move in such a way that a cilium, while quiet, stands quite upright, bends forward, and then throws itself backward. These facts derive great support from the circumstance, that we are able to perceive, that this functional activity becomes impaired if continued too long at a time. In all parts, certain stages of *fatigue* manifest themselves. Owing to this, it is necessary that the parts should have *rest;* a new supply of nutriment is not always required. A part which nourishes itself can either limit itself to a mere maintenance of its existence, or it may take up a larger quantity of nutritive material than is wont to happen in the ordinary course of things. When a part takes up a larger amount of material, it need not, on that account, fall into a permanent condition of enlargement, but there often arises a disturbance which endangers the persistence of the part, and becomes the proximate cause of its destruction. There are certain limits to the enlargement of every tissue, within which it is able to maintain a regular existence; if these be exceeded, and

especially if suddenly, we always see that obstacles spring up, impeding the further life of the part, and that when the process runs a particularly acute course, a weakening of the part sets in, preceding its complete destruction.

A number of inflammatory processes at first present only an increased assumption of cells, resembling what we find in simple hypertrophy. It is scarcely possible that these cells refuse to take up elementary granules when incited by a stimulus directly applied to them. If we select a part which is destitute of nerves, as, for instance, cartilage, we can produce altogether similar effects to those of inflammatory processes by direct stimuli. In precisely the same way we often see, in chronic diseases of cartilage, that the cells increase in size, swell into large, round corpuscles, and in proportion as they take on more matter, enlarge in all directions, so that at last the whole spot forms a little protuberance. There are few tissues in the body which are so completely destitute of nerves as cartilage; but even when we observe what happens in the parts most abundantly supplied, we find in every case that the extent of the irritated area by no means corresponds to the size of any particular nerve territory, but that a tissue in other respects normal, the size of the affected area, essentially corresponds to that of the local irritation. Great complaints would be raised against nature, if every ligature or seton would exercise an irritating influence upon the whole extent of the nerve districts through which it passes.

Structure of the Cornea.—The cornea is composed of layers, placed one against the other in a lamellar form, but yet connected with one another. A large, coherent mass, is therefore interrupted in certain directions by cellular elements. In opacity, a vertical section discloses spindle-shaped cells, which anastomose with one another, but at the same time possess lateral processes. When viewed upon the surface in horizontal section, they show themselves in the form of stellate, flat cells. The change is essentially seated in the corpuscles or cells of the cornea; and in proportion as we approach the clouded spot, the little, narrow cells continually become larger and more cloudy, and at last present the appearance of sacculated canals. While this enlargement is going on, the contents of the cells become more cloudy, causing the opacity of the whole coat, for the proper basis-substance appears to be altogether unaffected. This

cloudiness is partly occasioned by particles of a fatty nature. Now, since the cells, without ceasing to display their activity, have accumulated a larger quantity of material than usual, every thing is prepared for the process which we call reabsorption; the cells can transform a certain quantity of the material and convert it into soluble substances, and the material in this form may disappear in the very same way in which it came. From these phenomena direct transitions to incipient *formative changes* are frequently seen. If we follow up the higher degrees of irritation, we find that the cellular elements exhibit further changes which commence in the interior of the nuclei, generally in such a manner that the nucleoli become unusually large, in many cases somewhat long, and sometimes staff-shaped. Afterwards the nucleoli divide, and then the real division of the nucleus takes place. Here we have to deal with something essentially different from what we had before; the contents display a relatively slight amount of change, the utmost being that the cells become larger, whence we infer that a quantity of new material has been taken up into them. In many cases the changes are limited to this series of transformations, of which the division of the nucleus must be regarded as a conclusion. This may be repeated, so that three, four or more nuclei arise. If now we advance a step further in these processes, we come to the *new formation of the cells themselves.* After the multiplication of the nuclei has taken place, the cell may continue to subsist as a coherent structure; yet the rule is, that even after the nuclei first divide, the cells themselves undergo division, and that after some time two are found lying closely side by side. This is the natural, regular manner in which the real multiplication of cellular elements takes place. Then the two cells may separate, if the tissue possess intercellular substance, or may remain lying closely to one another, as in a tissue composed simply of cells.

We have hitherto only spoken of the *active* processes of cells; we will now turn our attention to the *passive* ones. Passive disturbances are those by which a portion of their activity is lost at once, or so completely destroyed that a diminution in the constituents of the body is produced.

Degeneration.—In the one series of processes there is a possibility of a repair, while in the other a regeneration can only take

place by means of a substitution of new cells from the neighborhood.

Necrobiosis.—Here we have to deal with a gradual decay and death, a dissolution, a mass in which absolutely nothing of the previously existing tissues is preserved. The necrobiotic processes which must be completely separated from necrosis generally result in *softening*, which commences with a friability of the parts; they lose their coherence, at last liquefy, and more or less moveable, pulpy or fluid products take their place. A second class is formed by the *simple degenerative* forms, in which at the conclusion of the process, the affected part is less fit for its action and has become rigid.

Indurations.—Among the necrobiotic processes, the one which is the most widely spread, and the most important in the course of all cellular disturbances, is fatty metamorphosis, which is attended by a continual accumulation of fat in different organs. The history of fat in its relation to the tissues may be considered under three aspects. We find one class which serve as reservoirs for fat, in which it is contained as a kind of necessary appurtenance, without, however, their own permanency being in any way endangered by its presence. Another in which the fat is found in them only at certain times, and transitorily, as in the ordinary absorption of fat from the intestinal canal. Finally, those which lead to necrobiosis. This necrobiotic development of fat is an entirely regular and typical process in certain parts of the body. The most important types are found in the secretion of milk, the sebaceous matter of the skin, the cerumen of the ears, and in the formation of the corpus luteum in the ovaries. If then you picture to yourselves these three physiological types, we have in the first case an accumulation of fat in the cells in such a way, that at the close of the process every single cell is entirely full of it. This yields us the type of the so-called *adipose cellular tissue*, as it occurs in such large masses, especially in the subcutaneous tissue, where it on the one hand gives rise to beauty, and on the other to the pathological conditions of obesity or polysarcia. Fat cells possess a membrane and fatty contents, but the fat so completely fills the interior, and the membrane is so extremely thin, delicate, and tense, that usually nothing else is seen than the drop of fat. When a person becomes thinner,

the fat gradually disappears, the membrane loses somewhat of its tension, is no longer so thin and delicate, and thus becomes distinctly manifest, being sometimes separated from the drop of fat, and even provided with a recognizable nucleus. This adipose tissue, when it undergoes retrogressive metamorphosis, is reduced to connective tissue, for between the cells a small quantity of intercellular substance again becomes apparent. This species is also the foundation of all anomalous fatty structures. The different forms of these structures are distinguished by the quantity of interstitial connective tissue which the tumor contains, and upon which their consistence depends. *Fatty degeneration of muscles* presents in many instances nothing else than an advanced development of adipose cellular tissue between the primitive fasciculi. Fat cells insinuate themselves between the primitive fasciculi, and lie in stripes in the direction of the muscular fibres. The development in this case has its origin in the interstitial tissue of the muscle. It sometimes happens at the commencement of the development that single rows of fat cells lying one behind the other alternate with the rows of muscular elements. In this case, where the primitive fasciculi are torn asunder, and the circulation of the muscles disturbed, it looks to the naked eye as if no muscular tissue existed.

The second series of processes consist in the transitory accumulation of fat in certain organs, as in digestion. When a fatty substance has been eaten, and has passed into a state of emulsion, we find that when it reaches the upper end of the jejunum, the villi of the mucous membrane becomes whitish, clouded and thick, and filled with extremely minute granules. These granules come in contact with the cylindrical epithelium with which every single intestinal villus is invested. A short time after digestion has taken place, the fat no longer lies only outside, but is found in the cells, first at their outer end, then gradually advancing further and further inwards. After the fat has advanced as far as the inner extremity, it passes into the so called parenchyma of the villus. In the interior of the villi we find the net-work of blood vessels a little below the surface, while in its axis there is a tolerably wide canicular cavity with a blunt extremity.

The *liver* is the most liable of all organs to fall into a state of fatty degeneration. The hepatic cells are filled with fat in the

same manner as an epithelial in the intestine. At first we find fat granules widely scattered and very small. They become more numerous, more closely aggregated, and after a time larger; at the same time the cells become larger, and smaller drops of fat are found in them, until, when filled to the utmost, they present the same appearance as those of adipose tissue, scarcely any membrane or nucleus being seen, nevertheless they continue to exist. In fatty liver the cells also continue to exist, only they are almost entirely filled with drops of fat instead of their ordinary contents. Even in this condition they contain a certain amount of matter capable of performing its functions. There is always a persistence of the histological constituents, and however much they become filled with foreign substances, they still continue to exist as cells. Hence it follows that a fatty condition of the liver may be removed, that it is curable without any particular regenerative processes being required. The only requisite is that the causes of the retention be removed, and the hepatic cells be freed from fat.

We will now consider the third series of fatty conditions a little more closely; those which are attended by a destruction of the elements, of which the secretion of milk and sebaceous matter are types. To the same category belong the ceruminous glands of the ear, and the large glands of the axilla. In all these parts a development of fat takes place precisely in the manner that we meet with it in the necrobiotic fatty metamorphosis occurring from morbid causes, in what we call sebaceous matter, milk or colostrum we have formations analogous to the pathological masses of fat which constitute fatty softening. The fat originates in the interior of epithelial cells, which gradually perish and set the fat free, while scarcely a trace of the cells is preserved.

Even with the naked eye certain changes can be recognized in the heart, viz:—a discoloration of its whole substance, which is of a pale yellow tint, and peculiar spots on the papillary muscles. If these are examined more closely, short yellowish streaks will be perceived, which communicate so as to present almost a plexiform arrangement and pervade the substance of the papillary muscles, while they offer a striking contrast to the reddish color of proper muscular substance. Wherever fatty degeneration attains a high pitch, great opacity will always present itself. A transparent part

becomes opaque when it undergoes fatty degeneration. Even in places where the parts were originally only translucent, a complete opacity may be seen to declare itself. Consider, for example, a kidney in the stage of fatty degeneration. The convulated uriniferous tubules of the cortex are very much enlarged, and its epithelium is in a state of fatty degeneration, so that within them nothing is seen except a crowded mass of fat-granules. Upon microscopical examination fat granules are seen collected in isolated groups; but upon slight pressure the mass disperses in such a way that the whole uriniferous tubule is filled with finely emulsive contents. If the surface of the kidney be examined, small opaque spots will be seen scattered in the most varied manner, most of them forming small segments of an arc, which are parts of the enlarged convoluted uriniferous tubules, and correspond with them.

In *genuine fatty metamorphoses* the normal structure of the part is ultimately destroyed, and the place of the histological elements is gradually occupied by an amorphous accumulation of fatty particles in a more or less highly albuminous fluid.

An inflammatory form of fatty degeneration is, strictly speaking, nothing more than a later stage, announcing the commencing disintegration of the structure of the tissue, when the part is no longer in a condition to continue a separate existence. Inflammatory conditions of this kind are of great importance, because in all parts where the essential elements become changed in this manner, no immediate restitution is possible. The kidney whose epithelium has passed into a state of fatty degeneration, nearly always shrivels, and the result is a permanent atrophy. The same thing is witnessed in the brain in yellow softening, no matter how it may have been caused. Even if inflammation have not taken place, a vacuum is formed, which is never again filled with nervous matter. When a muscle falls into a state of simple fatty degeneration, its primitive muscular fasciculi may have just the same appearance as if inflammation or permanent tension had acted upon it. It is therefore important for us to understand these different conditions; and in order to do this we will speak of the *really atheromatous conditions of the arteries;* for it is particularly in these that the confusion which has prevailed with regard to the interpretation of the change has perhaps been the greatest. The idea of atheroma presupposes

a closed sack, and by an atheromatous affection of the arteries, is therefore meant a change which commences at the surface of their coats. In this affection two processes must be distinguished in the vessels, which are analogous in their ultimate results; first, the *simple fatty metamorphosis*, in which the histological elements pass directly into a state of fatty degeneration and are destroyed; and secondly, a series of changes in which we can distinguish a *state of irritation* preceding the fatty metamorphosis, comparable to the stage of swelling, cloudiness, and enlargement, which we see in other parts. This kind of inflammatory affection is exactly the same as endocarditis, when it occurs in the parietes of the heart; the only difference is that the one more frequently runs an acute, and the other a chronic course. If we examine atheromasia a little more minutely, for example in the aorta, where the process is the most common, the first thing we see present itself at the spot where the irritation has taken place, is a swelling, which frequently is so large as to form a really hump-like projection above the level of the internal surface, distinguished from the neighboring parts by their translucent, cornea-like appearance. They are more opaque in their deeper parts. Next the internal coat passes into a state of degeneration, and the tumor becomes prominent, and finally the swelling may fluctuate and by cutting into it, the pultaceous matter is evacuated. If the mass be examined, numerous crystals of *cholesterine*, the *granule cells*, *fat-granules* and *large lumps* of half-softened substance display themselves, which give the *atheromatous matter* its *pultaceous character*. The principal difference which exists in a large vessel between atheroma and simple fatty degeneration is, that in the latter a slight swelling arises on the surface of the internal coat, which disappears if the superficial layers be removed by a horizontal section; in the former, we have, in the extreme stage, a depot which lies deeply beneath the surface, which afterward bursts, discharges its contents, and forms the atheromatous ulcer.

In the valves of the heart fatty degeneration takes place at the surface and beneath it. The description given for fatty processes also applies for *calcifications*.

Amyloid Degeneration.—Amyloid bodies have been supposed to partake of the nature of fat, albumen or fibrine. The first facts

by which we are enabled to determine more accurately the nature of this substance were furnished by the application of iodine to animal tissues. This substance occurs in the kidneys, liver, bowels, etc., in fact, there are but few parts of the body that may not undergo this change. We find bodies which in their chemical properties are analogous to real vegetable starch, and in form also bear a great resemblance to it. To this class belong the corpora amylacea of the nervous system, and the prostatic concretions. These formations in the latter case vary in size from very small simple bodies to gigantic ones, in which we see a succession of very numerous layers, when they are regularly formed. In these cases there seems to be scarcely any doubt that a substance is set free, which gradually adheres to the outside of pre-existing bodies all round, and that therefore we do not deal with the degeneration of a definite tissue, but with a kind of separation and precipitation, such as occur in other concretions from fluids. The peculiarity of these structures is, that by the simple action of iodine they frequently assume as blue a color as vegetable starch. When there is much albuminous matter mixed with it, it becomes green instead of blue. The greater the quantity of nitrogenous matter, the browner the color, and not frequently we find side by side in the prostate, concretions which, after the application of the iodine, present the most varied colors. So far, these formations are distinguished from the amylaceous corpuscles of the nervous system, which, one and all, assume a blue or bluish gray color on the addition of iodine. In the degeneration of the tissues, this substance never becomes blue under the influence of iodine alone, but a peculiar yellowish red color arises. If, however, a cautious addition of sulphuric acid be made afterwards, it displays a perfectly blue or violet color. In the liver we sometimes meet with stages where nothing is altered, except the minute branches of the hepatic artery. In a single acinus of the liver, we can distinguish three different zones in it, the external part, the seat of fatty infiltration; the intermediate, the amyloid degeneration; and the central, or pigmentary infiltration. Even with the naked eye, the pale, colorless, translucent and resistant zone of the amyloid change is sometimes recognized between the most external yellowish white, and the most internal, yellowish, or grayish brown layer. If a single hepatic cell

be watched, its previous granular contents become gradually homogeneous; the nucleus and cell-wall disappear, and at last nothing can be seen but a simple flake. In this way, the whole of the hepatic cells in the zone are converted into amyloid flakes, and if the process attains a very high pitch, the whole substance of the acinus is transformed into an amyloid mass. The most important disturbances of this kind with which we are as yet acquainted, are those which arise in the *kidney*. Not until iodine has been applied, can a diagnosis be readily made. If it be applied to a quite anæmic cortex, a number of red points usually first appear corresponding to the glomeruli, sometimes fine streaks also, which are the afferent arteries, and next to this, when the disease is very severe, red parallel lines are seen within the medullary cones, lying very closely to one another. Upon examining one of these glomeruli, we see that from the point where the afferent artery breaks up, the loops are no longer the fine delicate tubes that they were formerly, but appear compact and nearly solid. As these parts constitute the real points at which the secretion of the fluid portion of the urine is affected, we can easily conceive that in such cases disturbances must arise. Many cases of albuminuria which are attended with a decrease in the secretion of urea, are connected with these conditions, and the excretion becomes scantier in proportion as the disease increases in intensity. In an amyloid condition of the lymphatic glands, we see the small arteries, and the mass of minute cells which fill the follicles undergoing the change. The amyloid disease consists in a narrowing and thickening of these arteries, so that they convey less blood, and the conversion of the small cells into corpora amylacea; so that afterwards, instead of a number of colls in every mesh of the follicle, we meet with a single large corpus amylaceum. Thus, the gland seems as if it were sprinkled all over with little spots of wax, and, when examined microscopically, looks as if the contents of the follicles were a pavement of closely set stones.

The Origin of New Formations.—The mode consists in a series of changes from the time the nucleolus divides until the final division of the cell. If an epithelial cell requires two nuclei, it divides, and this process is repeated, and a series of changes is the result. If the skin becomes irritated, and this irritation is increased to a

certain point, the epithelium will thicken, and if the proliferation be very energetic, it may produce rather large tumor-like formations. This same mode of development is met with also in the interior of organs. We have another class of new formations in the body: these are processes in which endogenous changes set in, in the interior of pre-existing cells. In a simple cell a vesicular cavity forms, which, contrasted with the somewhat cloudy and generally slightly granular contents, presents a very clear, homogeneous appearance. Besides these cells, others are seen with two nuclei, one of which, in several of them, has become somewhat larger and brighter than usual, though still preserving the character of a nucleus. Subsequently, this vesicle becomes so large that the cell is gradually filled with it. Other vesicles are met with, besides those in whose interior the elements of a cellular nature are enclosed. The essential points of difference between the several modes of development of cells are therefore these: In one class the divisions proceed with a certain regularity, so that the ultimate products throughout exhibit a perfect correspondence with the parent structures. In another, the development proceeds in such a way that divisions also take place, which make rapid progress and produce cells, gradually decreasing in size, and sometimes becoming so small that they can scarcely be distinguished. The proliferation may then cease, and the cells severally increase, and thus, under certain circumstances, a structure may be produced analogous to that in which the development originated. Though so extremely simple in nature and theory, these modes of development are certainly difficult of demonstration in individual parts. Those which apparently ought to be the most conveniently situated for the purpose of investigation, are the epithelia. As the development here so often takes place upon the surface of the membrane, one would suppose that it would be very easy to trace its course accurately in the individual cells. There have been theories respecting this development, but at present, the cellular elements are believed to extend down to the very surface of the connecting tissue, and that in no spot do free nuclei, blastema or fluid exist; but that, on the contrary, they are the deepest layers which contain especially the most densely crowded cells. The *growth* of *bones* affords us direct standards with which we can compare the different new formations

which may occur in morbid conditions. All the larger bones grow in two directions: in length and thickness, the growth in the former takes place from cartilage; that in the latter from periosteum, Every new layer of osseous substance which is formed out of periosteum, is longer than the one immediately preceding it; every one which grows out of cartilage is broader than the preceding one. The growth from cartilage can only take place in the direction of the extremities of the bone as the cartilage of its diaphysis is, at a very early period of intra-uterine life, so perfectly ossified, that none remains, excepting at the two ends. A tissue once ossified ceases to grow, so that any increase of thickness in the diaphysis must be due to a development out of periosteum, in which growth proceeds much more slowly than in cartilage. This is the reason why the shaft of a long bone is narrower than its extremities. At the same time that the parts are being converted into bone, the medullary tissue is being developed within. Thus the development of bone does not consist only in the gradual opposition of a succession of fresh osseous layers, derived from periosteum and cartilage, but in the continual replacement of the innermost layers by masses of marrow. Medullary tissue therefore constitutes in some sort the physiological termination of the formation of bone as an organ. A cartilage cell is distinguished from almost all others by secreting a special membranous capsule, in which it is enclosed. This capsule, on the division of the cells which it contains, sends in septa between them, which serve as new envelopes for the young cells, so that the large groups are still closed in the greatly enlarged parent capsule. The cells which spring up from the great proliferation of the originally simple ones constitute the structures from which proceed all that afterwards arise in the longitudinal axis of the bone, especially the osseous and medullary tissue. The cartilage cells may be converted by a direct transformation into marrow ones, and continue as such, or they may be converted into osseous and then medullary tissue, or first into marrow and then into bone.

When a direct transformation into marrow is the first effected, the intercellular substance at the border next to the bone grows soft, then the adjoining capsules. Divisions take place in the cellular elements, so that a number of little nuclei arise in them. Subsequently the cells divide, and we obtain a number of smaller ones,

which contain a single nucleus, with a nucleolus, or sometimes several nuclei. Thus rises the *young, red medullary tissue*, as we see it in the marrow of new-born infants. These little cells may take up fat, which first appears in small granules, then by degrees in large drops, and at last may entirely fill them. The medullary tissue is thus transformed into adipose; the fat, however, is always contained in the interior of the marrow cells. This *yellow, fatty* marrow, does not occur in all bones.

The second series of transformations is furnished by the osseous tissue, which may arise out of marrow or cartilage. A calcification of the cartilage first takes place in the immediate vicinity of the border of the bone, then advances along the limits of the larger groups of cells and the individual cells, always following the substance of the capsules, so that every cartilage cell is surrounded by a ring of calcareous substance. Before this calcified cartilage can become real bone, it is necessary that the cavity in which every cartilage cell lies, be converted into the well-known radiated, jagged bone-cavity, (lacuna.) In this process the cavity of the capsule, which invests the cartilage cell, first becomes narrower, the inner border then assumes an indented appearance, and thus the space occupied by the original cell is considerably diminished, then the boundary which previously existed between the capsules of the cartilage cells and the basis substance disappears, and we find jagged elements, the future bone-cells. When the bone is by any cause impelled to enter upon new transformations, one bone corpuscle after another, with its territory, experiences the change. At the border of necrosed portions of bone, when the line of demarcation forms, we may clearly observe that the surface of the bone, when viewed along the edge, becomes marked with excavations. Cavities are noticed on the surface, which sometimes run together, and form holes. The bone-corpuscle, which formerly occupied the site of the opening, has, in proportion as it underwent transformation, determined the surrounding parts to enter upon the change. Without the aid of these processes, it is impossible to comprehend the history of caries.

The development of bone in thickness, can be best seen in periostitis. When the bone becomes thicker, the most internal vascular layer of the periosteum grows thicker, and swells. The cells which

result from the proliferation of the periosteal corpuscles, are converted into bone-corpuscles in the same manner as from marrow. The intercellular substance grows dense, and becomes almost cartilaginous in the vicinity of the surface of the bone; the cells throw out processes, become stellate, and at last the calcification of the intercellular substance ensues. If the irritation be very great, the corpuscles grow very considerably, and then real cartilage is produced.

Rickets.—Rickets consists in the non-solidification of the fresh layers as they form in bone; the old ones being consumed by the normally progressive formation of medullary cavities, and the new remaining soft, the bone becoming brittle. There is also displayed a certain irregularity in growth, so that stages in the development of bone which should set in late when the formation is normal, are manifested at a very early period. In normal growth the pointed processes, in which shape the calcareous salts shoot up into the cartilage, form along the margin of calcification, a completely straight line; but in rickets, interruptions occur in such a way that in some places the cartilage still reaches a long way down, while in others the calcification has mounted to a considerable height. These uncalcified parts sometimes become so completely separated from one another, that they remain, forming specks of cartilage in the midst of the bone, and cartilage is still found at points where the bone ought long since to have become transformed into medullary tissue.

Character and Nature of New Formations.—Morbid growths, consisting in augmented development of normal tissue, are denominated *homologous;* while those composed of elements having no previous existence in the organism, are termed *heterologous.* The first of these forms consists in mere hypertrophy of the elementary tissue, and may constitute *lipoma*, *adenoma*, or *angionoma*, according to the mode of arrangement; or a blastema may exude from the capillaries, as the result of irritation or inflammation, from which heteromorphous cells manifest themselves, and form the basis of morbid tissues, according to histological laws, which govern the development of the structures generally. These heterologous structures may comprise a great variety of adventitious tissues. These tissues, microscopically, consist of cells, nuclei, granules, molecules, fibres, tubes, and crystals of mineral matter, all of which may exist

in any single heterologous development, or the pathological tissue may be composed of a variety of combinations. The nomenclature of these structures is founded upon a knowledge of the component parts of the growth, and their similitude to well-known objects, as hygroma, resembling water; melanoma, black pigment; fibroma, fibres; lipoma, fatty, etc. These being the products of disordered nutrition, and inflammation of the textures, they will be fully considered in the chapter on inflammation. The character of these structures has been carefully studied by pathologists, and those which are of local character have been denominated innocent, or benignant; while those that were constitutional, and were immediately reproduced after their removal by the surgeon, have been termed malignant. These conditions were supposed to depend upon the circumstance as to whether the disease was confined to a limited portion of tissue, or one dependent upon dyscrasia of the blood. Recent pathological researches, however, have demonstrated that all forms of homologous development may become malignant under certain circumstances; and that, on the other hand, the most malignant forms may become innocent, and disappear by spontaneous resolution, or be successfully removed by the surgeon. In addition to all the morbid transformations occurring in the tissues of the body, there are parasitic growths, both of vegetable and animal nature. These vegetable parasites, which constitute the basis of favus, and many other diseases, belong really to the family of algæ and fungi. The mode of their development is essentially that of other cryptogamous plants. Animal parasites enter the body, either as ova, or in some stage of transformation, mostly in connection with food and drink.

From the foregoing pathological considerations, it will be observed that most essential information has been added to our previously existing knowledge of disease; and upon this we hope to establish a more scientific and successful system of medical and surgical practice.

SECTION III.

INFLAMMATION.

By inflammation, is understood an alteration of the vital activity of a part, manifested by morbid sensibility, or pain, by redness, increased temperature and swelling, generally with more or less febrile disturbance of the system.

There is, perhaps, no subject connected with pathology, of so much interest as this, nor is there a phenomenon of disease that has been more carefully studied; but it is only until quite recently that the entire subject has received a thorough explanation. The theories respecting its cause and nature which existed previously, based generally upon false hypotheses, exerted a most pernicious influence upon the principles and practice of medicine.

Inflammation was very generally ascribed to vitiated conditions of the fluids, until Van Helmont attributed it to a peculiar disturbance of the blood, dependent upon the pressure of gases, thus forcing it into the capillaries in undue quantity. This theory was also supported by Willis. Towards the close of the seventeenth century, several theories of inflammation, and of disease in general, were declared. The mathematical school of physicians, and especially Pitcairn and Des Cartes, attributed inflammation to an *error loci*, or to obstructions which they supposed occurred in the passage of the blood from one portion of the body to another. While Des Cartes and his followers insisted much on the various forms of the globules and pores of the blood, the mathematicians contended principally for the different sizes of the globules and capillaries. Boerhaave's theory, although not altogether original, was an important modification of those previously advanced. He claimed that the blood became more viscid, causing a *lentor* in its circulation through the capillaries, producing an engorgement of them, and that the in-

creased action of the large vessels is for the purpose of overcoming the obstruction which exists in the small ones. According to Hoffman, inflammation is owing to spasm of the capillaries, which suspends or impedes the circulation in one part, and determines it inordinately to others, red blood being thus forced into capillaries (which, in other circumstances, admit only the serous portion) from which result pain, swelling, and heat. While these doctrines were dividing medical opinion, and that of Hoffman gaining the ascendency, Haller published his opinions on *irritability*. He believed that the accumulation of blood in the capillaries was caused by constriction of the small veins, and that its diverging to any particular part was ascribed to the removal of the resistance furnished by the state of the capillaries and veins, and that extravasations of the red particles constituted a part of the redness observed in some inflammatory tissues. Towards the close of the last century, some pathologists ascribed it to relaxation and diminished action of the capillaries; others, again, to increased action of these vessels. The former doctrine originated with Vacca Berlinghieri, and was promulgated in this country by Dr. Allen, who modified the doctrine of Berlinghieri, and contended that the action of the arteries is increased, a larger quantity of blood being forced into the capillaries than they can transmit. Dr. Philip modified this doctrine in a different manner; and while he maintained that the extreme vessels are primarily weakened, he contended that the action of the heart and arteries supplying them was very much increased. In farther illustration of his views by experiments and microscopical examinations, he remarks, that "the motion of the blood is retarded in the capillaries, in consequence of the debility induced in them; an unusual obstacle is thus opposed to its motion in the arteries, preceding them in the course of the circulation, which are thus excited to increased action." He infers the debility from the apparent retardation of the circulation of the red globules in his experiments, and concludes that this stagnation must really exist.

The doctrine of increased action of the vessels in an inflamed part, may be attributed to Drs. Gorter, Gaubius, and Glisson. They considered that inflammation was the consequence of irritation, which increases the vital action of the vessels, and propels the colored blood into the colorless capillaries. Mr. J. Hunter laid the foun-

dation of the true theory. He supposed that the vessels are in a state of increased action, both as to contraction and dilatation, and that in a general sense, they carry an increased quantity of blood. Irritability and mobility, the two great properties upon which organic actions mostly depend, are probably always increased in inflammations. Owing to the increase of the former, all inflamed parts are more than naturally susceptible of the action of stimuli. The defect in Hunter's doctrine was, that he did not consider the altered condition of the vital properties in their very nature, but imputed the essence of inflammation to a simply "increased action of the powers of the part." He erred, also, in supposing the vessels to be muscular, consequently his reasoning on the nature of the disease is more or less vitiated. In his work on Inflammation, in speaking of the action of the vessels, he observes:—"The very first act of the vessels, where the stimulus which excites inflammation is applied, is exactly similar to a blush. It is simply an increase or distention beyond their natural size; and whatever purpose the increase of the size of the vessels may answer, we must suppose that it allows a greater quantity of blood to pass through the inflamed part than in the natural state, which supposition is supported by many other observations."

A theory opposed to the former, and now universally adopted by the physical school of medicine, supposes that the vessels concerned in the inflammatory process, are passively relaxed; a progressive accumulation, stagnation, and coagulation of blood occur in them; that the collateral vessels are enlarged in proportion to the redundancy of blood; that the blood is propelled through them by the action of the heart; and, therefore, the vessels cannot perform any part in generating the inflammatory products; but, on the contrary, that all the fluids are mechanically strained off from morbid blood, notwithstanding the obstruction caused by the coagulation.

The first changes occurring in the capillaries, are a slow and gradual contraction followed by an increase of circulation. This change is sooner or later followed by relaxation, and a corresponding decrease in the passage of blood. Eventually, this dilatation so weakens the circulation that the current is observed to be irregular, and the blood corpuscles are found adhering to the walls of the vessels. This, however, in the first place, is confined mostly

to the white or lymph corpuscles, while the red are elongated, and pass with more freedom through the centre of the tube. Finally, however, the red blood corpuscles become attached to the white ones; mingling together, they constitute a coagula which obstructs the circulation. This obstruction is denominated congestion; if, however, the congestion be of long duration, the chemical and mechanical influences of this homogeneous coagula upon the distended capillaries produce pathological conditions of its structure; admitting of the transudation of the aqueous solution of the blood through its walls, (exudation) or a solution of the vessels may occur and the blood-corpuscles escape, as exemplified in the second stage of pneumonia, where the light transparent albuminous exudation is converted into rusty sputa by the mingling of partially disintegrated red blood corpuscles that have escaped from the fractured capillaries of the inflamed tissue. This phenomena of inflammation is illustrated in Fig. 12, where an active

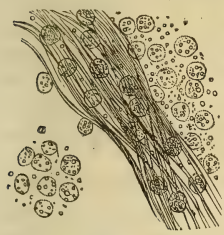
[Fig. 12.]

stimulant is applied to a section of web in a frog's foot. It exhibits the capillary network with red and white corpuscles; an elongation of the red ones passing through the central current, the white adhering to the walls of the vessels; the formation of the coagula, and finally the obstruction of the vessels, and the commencement of the process of exudation. The causes that contribute to these varied phenomena of the inflammatory process have been referred to the irritability and contractility of the capillaries; to the changes

in the vital forces, caused by morphological transformations in the nerve tissues; to the irritation of the blood upon the capillaries when in a state of dyscrasia, and to the mechanical influence of dilated and contracted capillaries upon its fluid contents.

Histological Changes.—The transformations occurring in the liquor sanguinus, after it escapes from the vessels, during the process of inflammation, constitute the morphological condition of all the adventitious and heterologous developments occurring as a product of inflammatory action; whilst the degeneration of these structures and of the exudation, completes the series of pathological changes existing in all the organs and tissues of the body occurring in disease.

The more simple form of exudation where it occurs upon the serous membrane is its conversion into fibrous tissue. This occurs by the simple precipitation of molecules arranging themselves in a linear manner, and as they become more numerously developed, bundles of fine delicate filaments may be observed crossing each other, and in time they are converted into dense fibrous structure. Interspersed between these fibres may be seen a number of lymph corpuscles which entirely disappear as the fibrous structure becomes more perfect. This arrangement is well illustrated in Fig. 13.



[Fig. 13.]

The small cluster of lymph corpuscles upon the left, exhibits the granules enclosed in the cell wall after the addition of the acetic acid. In this manner all the adhesions occurring during the process of inflammation are developed. This peculiar fibrous arrangement of the plastic lymph or liquor sanguinus occurring during the process of exudation, is peculiar to that of the fibrous tissue; while that occurring in the mucous surface, or in the areolar tissue is almost always converted into pus-corpuscles. The exceptions to this general rule of the development of pus, the result of an inflammation of the mucous membrane, are where it is converted into fibrous tissue in pseudo-membranous croup (inflammation of the mucous membrane of the trachea) and diphtheritis. In dense parenchymatous bodies, as the liver, spleen, kidneys, etc, the exudation is generally converted into granular matter; hence,

we have granular degeneration of the kidneys as the result of hyperæmia or inflammation, and a similar phenomenon occurs in the liver, spleen, and brain. The exudation upon the superficial tissues, as wounds, is transformed into pus when the lesion first occurs; but as soon as the healing process commences. free nuclei appear in the liquor sanguinus, which are soon arranged into nuclei, cells and fibres, by which process cicatrization is effected. These normal transformations of the exudation, in special tissues of the body, form the basis of those pathological conditions and heterologous structures occurring during the progress of disease. Hence, we observe in pleuritis, peritonitis, pericarditis, fibrous matter arranging itself into fibrous tissue as illustrated in Figs. 14,

[Figs. 14, 15, 16, 17, 18.]

15, 16, 17, 18, showing these different stages of development; whilst on the mucous membrane, as bronchitis, urethritis, and vaginitis, the exudation is soon transformed into pus corpuscles; hence, the purulent discharge from all mucous membranes during the existence of inflammatory process. When a solution of this structure is impaired, the deeper portions of the exudation are converted into granular matter, nuclei and cell fibres, while the more superficial layer is still transformed into pus.

Pus, when examined, is found to be composed of small globular bodies, with a granular surface about one-two-thousandth of an inch in diameter. They become much increased in size upon the addition of water, and entirely dissolved by strong acids. They consist of a cell-wall, which sometimes is surrounded by albuminous layers. The contents consist of fine molecules of fatty matter, with one or two granules, with a central shadowed spot. They roll freely upon each other in the liquor puris. See Figs. 19, 20. Scrofulous, and all forms of pus, where

[Fig. 19.] [Fig. 20.].

there are great exhaustion and feeble vitality, are composed of ill-shaped, irregular corpuscles, which dissolve soon after they are formed, and are converted into granular matter, and an acid fluid. See Figs. 21, 22. As we have previously stated in our chapter on Pathology, pus, in its organic character, is not absorbed, but the cell-walls become dissolved, the fluid is taken up, and enters the circulation; while the inspissated portion is converted into fat granules, which ultimately become degenerated, enter the circulation, and contribute to the effete matters of the blood. In solid organs, the exudation, occurring as it does in the connective tissue, usually undergoes granular degeneration, and becomes permanently incased in the compact tissue. Farther degenerations of this granular matter occur, as in cases of ramollissement cerebrum and ramollissement spinalis; also, in hepatization of the lungs, degeneration of the kidneys, hypertrophy of the liver, spleen, etc. These metamorphoses may lead to ultimate suppuration, as exemplified in degeneration of the kidneys, cirrhosis of the liver, etc. In other cases, these leucocytes forming in the cellular tissue, entirely destroy its organic character, and occupy its position. It is in this way that abscesses are produced in most of the parenchymatous organs, after a slow process of inflammation. This process of degeneration is beautifully illustrated in Fig. 23. Another change which occurs in the liquor sanguinis, as it escapes from the capillaries during the inflammatory process, is its conversion into cancerous cells. These are produced primarily from mechanical influences:—thus, a lady may receive an injury or a contusion upon the mammæ, which results in a slow form of hyperæmia and inflammation. The cells of the liquor sanguinis, instead of being converted into granular matter, undergo morphological transformations, become spindle-shaped, caudate, oblong or square, and full of nuclei, which admit of rapid development, and result in the formation of all the varieties of carcinoma. These structures may all exist in a single cancerous mass, constituting the heterolo-

[Fig. 21.]

[Fig. 22.]

[Fig. 23.]

gous forms, as encephaloma, colloid, scirrhus, etc.; or any of them may develop separately, constituting simple carcinóma; or the exudation may undergo granular degeneration, and constitute the various deposits of scrofulous and tuberculous matter. The metamorphoses of the exudation into tuberculous and cancerous masses, depend upon the vitality of the plasma. Thus, where there is a feeble condition of the organism, and the vital forces are inadequate to the support of organic tissue, granular degeneration of the exudation occurs; and it is the farther degeneration of this product that constitutes the various forms of tubercles. The miliary tubercle consists, then, in a mere aggregation of the granular matter which occurs upon the solution of the albuminous corpuscles, while the calcareous and cretaceous are but the mineral degenerations of this soft tuberculous mass. During the process of exudation, all forms of metamorphoses may become abortive. Chemical changes occur in the liquor sanguinis, the corpuscles dissolve, and sulphureted hydrogen gas is evolved, which gives a blackish appearance to the exudation. This condition is denominated *gangrene;* and if this disintegration extend to the neighboring tissues, they are converted into granular matter, or a soft, pulpy substance, which is the entire death of the part, or *mortification.*

Ulceration is a condition of the exudation, where the cells undergo decomposition in a slow manner, and where a partial formative process is maintained.

Symptoms.—The phenomena of inflammation are redness, heat, swelling, and pain. The *redness* is probably the result of an increase of red corpuscles in the distended capillaries. It may be of a bright red, crimson, or purple hue, and usually continues after death. The *heat* is the result of the increased sensibility of the nerves, and its accumulation in the part, produced by the rapid chemical and physiological changes occurring in the inflamed capillaries. It will be borne in mind that the ordinary transformations are interfered with in the inflammatory process. One of the functions of the skin is to convert the disintegrated tissues into watery vapors, which, by evaporating from the surface, tend to maintain a normal temperature, and it is probably a want of this evaporation that increases the heat of the parts. It has been found that the average increase of the temperature of the blood during constitutional in-

flammation is about four degrees, while that of scrofulous tumors and local inflammation has been estimated much higher. By producing artificial evaporation, or applying moisture to the part, either in the form of tepid or cold water, the temperature is reduced.

The *pain* varies much in degree, and is essentially modified in different tissues. That experienced in more dense tissues, as the serous and osseous, is usually sharp and lancinating; while in the parenchymatous organs, it is dull and heavy, and occasionally amounts to soreness. In the mucous surface it is more of a burning or smarting sensation, and in the nerves it is generally remitting or intermitting. The causes of the pain are an alteration in the sensibility of the part, and pressure from the engorged vessels upon the nerves.

The *swelling* is produced by an influx of blood to the part by the exudation into surrounding tissues, and the formation of new growths during inflammation.

Chronic Inflammation.—Chronic inflammation is characterized by all the essential changes of the acute form. It differs, however, in this, by being preceded through all its changes with symptoms so mild, that it is only after the metamorphoses of the exudation that the patient experiences much constitutional inconvenience.

Causes.—Constitutional and Predisposing.—Age has considerable influence upon the inflammatory process. It is greatest in childhood and youth. The brain and its meninges, the serous surfaces within the thorax, the glands and the lungs, and mucous surfaces, are most frequently affected in youth; but in more advanced life, the digestive, respiratory, urinary, and generative organs. Males are more frequently affected than females. Of temperaments and diathesis, the most influential are the sanguineo-melancholic and irritable; the scrofulous, gouty, and rheumatic. Habits and modes of life dispose to inflammations of various organs. The liberal use of animal food or fish, favors the occurrence of every variety of inflammatory action, or generates an inflammatory diathesis. Excitng or intoxicating beverages to predispose inflammation, especially of the digestive and urinary organs. A plethoric habit of body, the temperature, season and climate, favor its appearance. When the functions of the stomach and bowels are disordered or impaired, and when the liver is torpid, and accumulations of bile are formed

in the biliary ducts or gall bladder, there is a strong predisposition to inflammation. Excessive mental emotions also favor its occurrence.

A predisposition is often inherent from hereditary conformation or temperament, and from previously disordered states of certain organs or tissues.

The *exciting* causes are very numerous and diversified, but uncertain in their operation, or ascertained with great difficulty. Among these may be mentioned mechanical and chemical irritation, disturbed equilibrium of the circulation produced by cold, fatigue, mental anxiety, morbid poison in the blood, metastasis, malarial poisons, etc., etc. The more direct of these causes produces the morbid effect in the following ways:—Some act by injuring the organization; others excite the organic nervous sensibility of the part, and consecutively its vascular action; some affect the function and circulation of the organ, or produce a specific or morbid action in the part, changing the organic nervous sensibility, the vascular action, and all the vital conditions, both locally and generally, and morbid matters secreted by an organ, or carried into the blood from a diseased part, may cause inflammation by their direct effect upon the capillary vessels. Morbid matters secreted by an organ, or circulating in the blood, frequently produce inflammation of either neighboring or distant organs.

Treatment.—In considering the treatment of inflammation, only general principles admit of being discussed, until we speak of special inflammatory diseases. In the commencement, we should ask for the cause, and if possible remove it; then attempt to obtain resolution, or to remove the inflammatory action, so as to prevent the morphological transformations in the exudation. To produce this, heretofore the general practice has been to adopt the antiphlogistic regimen, or a low diet; also to administer purges, apply counter-irritation in connection with blood-letting, mercurials, and antimony. The objections to blood-letting are, that unless carried to a very dangerous extent, it does not diminish the blood in the inflamed part, or render the impure blood pure, or in any way remove the *materies morbi* circulating in the fluid, beyond the proportion of that extracted; and that it debilitates and exhausts the patients, or prevents the conservative manifestations so essential to a favorable termina-

tion of the disease. Of the effects of mercurials, antimony, and other depressing agents, together with an antiphlogistic regimen, it is now generally conceded that they tend not only to depress the vital energies and impair the nervous system, but by their peculiar influence upon the blood and blood plasma, prevent those essential transformations, upon which the favorable terminations of inflammation depend. In speaking of the effect of blood-letting in the treatment of inflammation, Dr. Tanner remarks that in Bethlehem Hospital, the system of treatment for inflammation of the brain fifty years ago, was bleeding, purging, and vomiting, in the spring months; that certain days were appointed on which the patient was bled; another, in which they were purged; and another, in which they were vomited. They were bled again in May and June. He also states that all sympathetic disorders in pregnancy were attributed to plethora, and bleeding resorted to, when in fact they were due to anæmia. Andral and Gavarrat, in their experiments, showed that the normal proportion of blood-corpuscles is one hundred and twenty-seven; that the essential character of plethora, is that the proportion is largely increased, and that in pregnancy they are always diminished. Again, he says:—"I think it may be remarked that those practitioners who have the greatest amount of practical experience, combined with an extensive knowledge of physiology, pathology, and therapeutics, are now mostly agreed that our study should be confined to simply attempting to guide the morbid process to a favorable termination, just in the same way as we at present try to conduct cases of typhus, small-pox, scarlatina, &c., through their natural progress, without making heroic and injurious efforts to cut short the disease. This object is to be obtained by supporting the vital powers, instead of lowering them, and by assisting the excretion of effete products. During the early stages of the attack all sources of irritation should be removed, so that the patient may enjoy perfect quiet of body and mind; the sick-room should be well ventilated, and kept at a temperature of about sixty degrees Fahr.; the diet should be light, and cold water freely allowed; opium is generally to be administered, if there be pain or much irritability; and if the febrile excitement be great, salines in small doses.—

When the pulse becomes soft, good beef-tea and nutrients are to be administered; and if there are indications of weakness, we

may be sure that wine is required, in quantities varying from four to twenty ounces in the twenty-four hours. In all acute disorders the various organs are much weakened, so that their functions are either partially or entirely arrested. To give food, when there is a perfect loathing of it, is worse than useless; but we may advantageously give alcohol and wine to retard the destructive metamorphosis of tissue, to afford to the system the elements for the generation of heat, to repair the nervous energies, and to supply a stimulus to the nervous system. As the period of crisis approaches, Dr. Bennett's example may be followed, of giving a diuretic,—spirits of nitric ether, half a dram, with or without ten minims of colchicum wine,—thrice daily, to favor the excretion of urates, while, when a crisis occurs by sweating or diarrhœa, care is to be taken not to check it in any way.

The success of this plan is apparent from the following: During the eight years ending in 1857, Dr. Bennett had thus treated all the cases of pneumonia which had been under his care in the clinical wards of the Royal Edinburgh Infirmary, amounting to sixty-five, of which number sixty-two were dismissed cured, and three died; that is, one in twenty-one and two-thirds. Of the sixty-two cases cured, fifty-five were uncomplicated, and seven complicated; of fifty-one of the uncomplicated, forty were single and eleven double pneumonias, the average duration of the former being fourteen and one-half days, and of the latter twenty-one days; while of the seven complicated, one supervened on bronchitis and emphysema, two on typhus fever, one on bronchitis and pleurisy, one on pleurisy with effusion of eight weeks' standing, one on rheumatism with heart disease, and one on severe rheumatism with endocarditis and pericarditis, the average duration of the pneumonia in these seven being twenty-one and one-third days. The three fatal cases were all complicated; the first, with uncontrollable diarrhœa and follicular disease of the mucous membrane of the small intestines; the second with persistent albuminuria and anasarca; and the third with delirium tremens and universal celebral meningitis.

When this result is contrasted with that obtained from an opposite course of treatment, it seems to me that all doubt on the subject must be removed. Thus, during ten years,—from 1st July,

1839, to 1st July, 1849,—six hundred and forty-eight cases of pneumonia were treated, by different physicians, according to the rules then enforced by all writers, in the Royal Infirmary of Edinburgh, of which number three hundred and eighty-eight were cured, thirty-eight relieved, and two hundred and twenty-two died. Of one hundred and seven cases, recorded by M. Louis in 1835, and treated by bleeding and tartar emetic, thirty-two died. So, of six hundred and forty-eight cases treated by Racori, in the hospital at Milan, by large doses of antimony, one hundred and forty-three died. Again, Laennec, who bled moderately at the commencement of the disease, regarded the mortality as one in six or eight. And lastly, Dr. Dietl treated three hundred and eighty cases of primary pneumonia, in the Charity Hospital of Vienna, thus, eighty-five by venesection, one death resulting in five; one hundred and six by large doses of tartar emetic, with one death in five twenty-two one-hundredths; and one hundred and eighty-nine by diet only, with one death in thirteen and a half, all the fatal cases, moreover, being complicated.

"At the same time that bleeding as an antiphlogistic remedy should be rarely, if ever practised, it may be remembered that a small loss of blood may often be beneficial, particularly in relieving excessive pain, and in moderating attacks of dyspnœa due to some obstruction to the circulation in the heart or lungs. As Dr. Bennett remarks: "I have often been struck, especially in cases where large thoracic aneurisms cause these symptoms, with the small loss of blood which will occasion marked relief. The same result may be hoped for in other cases where the congestion is passive, even when that is associated with active repletion of blood, followed by exudation. But I need scarcely remark that this mere palliative object of blood-letting is not the ground on which the practice has hitherto been based, and that in this point of view it requires to be very differently explained." The same remarks apply to the use of tartar emetic, which is valuable in small doses, and combined with other neutral salts to favor excretion by the skin, kidneys, or intestines, but most injurious when employed in the heroic way often recommended."

"With regard to the use of mercury, there appears to be every reason to believe that its utility in controlling inflammation or in

promoting absorption of the effused products, has been very much overrated; and indeed it seems highly probable that inflammatory diseases will progress more favorably without the use of this medicine. Few practitioners even now would think of treating pericarditis or iritis without mercury; yet more than fourteen years have elapsed since Dr. John Taylor's valuable contributions to clinical medicine were published, in which it was clearly shown that the opinions then current on this subject required revision. For example, of the cases on which this excellent physician founded his observations, four got well without any treatment; in twelve ptyalism was not followed by any abatement of the pericarditis; in six, ptyalism was followed by pericarditis; in three, by endocarditis; in two, by extensive pleurisy; in four, by pneumonia; in one, by erysipelas and laryngitis; in one, the pericarditis and pneumonia both increased in extent after ptyalism; while in only one instance was salivation followed speedily by relief, and in two or three by a gradual diminution. More recently, Dr. Henry W. Williams has cured sixty-four cases of iritis, of every degree of severity, including its idiopathic, traumatic, rheumatic, and syphilitic varieties, without a dose of mercury; the treatment having chiefly consisted in sustaining the general system, in relieving pain by narcotics, and in keeping the pupil dilated by belladonna."

"From all this it follows that, in the treatment of acute inflammatory diseases, practitioners must be content to trust more to Nature and less to heroic remedies than they have been in the habit of doing; for it is highly probable that though we may be able to guide inflammations to a successful termination, yet we cannot cut them short, and any attempts to do so will merely increase the patient's danger. It should never be forgotten that "the body possesses a perfectly marvellous power, whereby it protects itself against diseases, wards off some, cures in the best and speediest way many of those that have set in, and by a process of its own brings others more slowly to a favorable issue. The innate power is called the *vis Naturæ medicatrix*, being justly appreciated by physicians and philosophers, and highly praised by them. Of itself it is sufficient to cure numerous diseases; in almost all, its influence is beneficial; and, moreover, the remedies that are in their own nature

the best, are only of use in as far as they stimulate, direct, and control this inherent virtue."

In addition to the suggestions of Dr. Tanner, in the treatment of inflammation, the greatest benefit will be derived from an early attention to the condition of the stomach and bowels. Where the stomach is vitiated, either by morbid ingesta or other causes, a free lobelia emetic should be administered. The bowels should be opened by means of liberal doses of equal parts of compound syrup of rhei et potassa, and the fluid extract of leptandria virginica. The surface should be frequently sponged in tepid water, the increased arterial excitement subdued by appropriate doses of the tincture of veratrum viride, and a gentle diaphoresis maintained by means of the tincture of aconite folio. The idea that inflammation cannot be cut short, or controlled at once, is not borne out by observation, as under the more modern and rational treatment of this disordered condition, it has been amply demonstrated that the inflammatory process can be at once arrested by proper measures, either by remedies that act specifically upon the diseased capillaries, or by hot packs or cold applications according to the nature and character of the inflammatory action, and if the disease is in the early stage, caused to terminate in resolution.

SECTION IV.

CONSIDERATION OF FEVERS.

Pathological researches have not yet been as successful in revealing the seat, nature, and character of fevers, as in some other diseases. This may be owing partly to the nature of the investigation, it being mostly confined to autopsic appearances, while a correct physiological analysis of the symptoms manifested in the progress of the disease, has been in a great measure neglected.

A study of the causes, symptoms, and effects produced by the remedies, and the character of these phenomena, and those of organic modifications in a state of health, together with microscopic autopsic appearances, will enable us to arrive at a more just conclusion relative to all the pathological changes connected with fevers.

The phenomena of fevers are so numerous and so different in appearance, that it would be almost impossible to give them a minute description. There is not a single derangement of function, or of tissue, which I have not observed in these diseases. They have then no specific symptom nor pathognomic sign; even the hot skin, rigors, and accelerated pulse, exist in diseases when fever is not present. Although this is true, relative to a single phenomenon, yet there are a series which are so uniformly present in what is termed idiopathic fevers, that we call the disease fever, when the symptoms are manifested in the following order:—

1. Nervous depression, characterized by languor, lassitude, and debility.

2. Rigors and chills, connected with superficial capillary congestion, an irregular pulse, and hurried and oppressed breathing.

3. Reaction, characterized by a dry tongue, scanty urine, and loss of appetite. When these symptoms appear in the order in which

they are here laid down, we denominate the disease fever. Although the above series of symptoms must always be present in the preceding order to constitute fever, it by no means includes the entire number present. These symptoms indicate the disturbance, or abnormal manifestation of,

1. The nervous system, as indicated by the debility, lassitude, aversion to mental and physical exertions, restlessness, creeping chills, horripilations, alternations of flushing heat, and irregular breathing.

2. A hurried and irregular action of the heart and arteries, dependent upon the abnormal nervous manifestation.

3. Immediately following this increased circulation of the blood, is an increased and abnormal temperature, a derangement of the secretions, as indicated by the scanty urine, dry tongue, hot skin, increased thirst, anorexia, &c., giving unmistakable evidence of the entire inability of the nervous system to afford these important organs the necessary stimulus. In thus carefully noting the changes which manifest themselves in all idiopathic fevers, we can commence at the derangement of the brain and nervous system, and follow the entire series of physiological and symptomatological changes, as arising from, and dependent upon the primary cause of this entire class of diseases.

In our classification of fevers, we have adopted that which appears to be the only one warranted by the manifestations of this disease.

1st. Ephemeral Fever is the simplest of all forms, yet it manifests the entire series of phenomena; but, owing to the mildness of the cause, lasts only twenty-four hours. The cure is effected by the recuperative powers of the system.

The next form is that of Intermittent Fever, in which so much of the cause is removed as to relieve the nervous system for the time, but not entirely relieving the system from the morbid influences. During the thermal changes of the body in rest and sleep, the poisonous cause makes a sufficient impression upon the brain and nervous system to obstruct the proper supply of vital stimulus to the dependent organs of the body, and the result is a repetition of the paroxysm or Intermittent Fever. If the shock received by the brain and nerves prevents a temporary restoration and reaction,

the fever is called Remittent or Continued. When the secretory and excretory system are so far deprived of the necessary stimulus as to produce an entire suspension of these functions, and the circulating organs are exceedingly languid from the same cause, the fever is called Typhus or Congestive.

When, in addition to the above symptoms, there is an eruption accompanying the disease, it is denominated exanthematous or eruptive fever. When it originates as the result of local irritation, such as wounds, disorganization of the lungs and other parenchymatous organs in tuberculous and scrofulous patients, it is denominated irritative and hectic. When upon local inflammation, the nomenclature of the fever usually corresponds with the organ diseased, such as lung fever, brain fever, bilious fever, etc.

The Nature and Character of Fevers.—From the earliest history of medicine until the present, there has not only been a great variety of theories and opinions advanced relative to the disorder, but much unsuccessful practice founded upon them. Thus, the ancients supposed fever to depend upon a warfare between the vital forces of the body and some noxious element which had invaded the system.

Hippocrates ascribed the different fevers to the four humors, blood, phlegm, yellow and black bile. Galen supposed that the various forms of ague depended upon the corruption of the different fluids; and that, in whatever part of the body the heat began, it ultimately terminated in the heart, causing increased motion of the blood and accelerated pulse, followed by an effort of the *vis vitæ* to expel the poisonous agents from the system, and to assimilate the healthy fluids to sustain the different organs of the body. Sydenham says, "that reason dictates that a fever is nothing else than an effort of nature to thrust from the system morbific matter, in order to restore the patient to health; and that diseases are introduced into the system in the form of poisoned air and otherwise. Avicenna attributed the phenomena of fever to the superabundance of the different humors. Stahl maintained that they depended upon plethora or over-fulness of the vessels, and a depraved condition of the fluids. Hoffman maintained that fever consisted in a spasm of the capillaries, caused by some morbid affection of the nervous system. Cullen contended that it depended upon certain

abnormal changes occurring in the brain. Dr. Benjamin Rush, that all diseases are a unit; and that fevers, as well as other affections, depend upon an irregular action, which is the proximate cause of every form and modification of disease. *Ploucquet* claimed that all fevers were dependent upon inflammation of the brain. Broussais that all fevers depended upon an altered condition of the mucous surface of the stomach and bowels, mostly confined to the mucous follicles; and that, as the disease advanced, they passed into a state of suppuration. Admitting that simple or follicular enteritis is the commencement of a great number of fevers, can every thing be explained by them? We never thought so; and it has always appeared to us that these fevers never become severe, except in consequence of a disturbance which supervenes in the innervation and hæmatosis.

This disturbance of hæmatosis and innervation, which gives rise to the phenomena called adynamic and ataxic, or in other words, to the typhoid state, may be the result of several lesions, different in their nature and in their seat.

Gastro-intestinal inflammations give rise to it more frequently than diseases of any other organ. Other organs also, however, though less frequently than the digestive tube, may occasion it as phlebitis, pneumonia, particularly in aged persons, erysipelas, phlegmon, inflammation of the urinary passages, an abscess developed in the prostate, metritis, several forms of inflammation of the liver, variola, acute inflammations of the synovial membranes, etc.

Thus the typhoid state, may be developed, in consequence of a great number of affections widely differing from each other: it is a collection of symptoms identical as to their ultimate seat, but not as to their origin. If it be a primary alteration of the blood which gives rise to them, these symptoms may acquire, in a few hours, their highest degree of development; and, in some cases, even occasion sudden death. If the commencement be in an organ where inflammation is rapidly developed, as in a lung, or vein, the typhoid symptoms will have a quick course and a rapid termination, similar to the inflammation. This occurs in inflammation of the lungs, liver, mucous membrane of the stomach and bowels, spleen, kidneys, brain and spinal marrow.

To study the nature and character of fever, it is not profitable

to pursue our investigation to any extent into the theories and doctrines of the disease as previously taught, but with our contemporaries to try and study more fully its essential character by carefully examining the pathological condition of the organs and tissues involved.

The Condition of the Capillaries in Fevers. — In all forms of fevers, the capillaries are the seat of disorder. The affection is not confined to these vessels of one region, organ or tissue, but is diffused over the minute ramifying communications of the aorta and venous branches, in whatever part they are found. It is merely requisite to consider the phenomena of fever in the living body, and its traces and effects in the dead, to verify this statement.

The disorder of the capillaries of the brain, both cranial and vertebral, is indicated by pain in the head in the commencement of the attack, the derangement of thought and the tendency to stupor during its progress, and absolute coma towards the end. But when blood or serous fluid is found effused into the capillaries, when the vessels of the brain are turgid, distended with blood and more numerous than natural, it is impossible to resist the inference as to the overloaded cerebral capillaries during life. Cases are sometimes adduced, in which there is no pain or derangement of thought observed, indicating that the stage of natural sensation is passed. In ague, the oppression of the cerebral capillaries may be so great as to constitute phrenitic ague.

The disturbance of the capillaries of the spinal cord is manifested by pain and weight in various parts of the column, the derangement in the muscular motions and by the tetanic spasms and convulsions. After death, much serous fluid flows from the *theca;* the vessels of the cord are numerous and expanded, and sometimes pure blood issues from its capillaries.

The capillaries of the lungs are always oppressed and overloaded in fevers. During the fit of ague, the respiration is quickened, sometimes thirty or thirty-six more than natural; the patient complains of oppression in the breast, cannot breathe fully, pants and has frequent cough. In persons predisposed, hæmoptoë occurs during continued fever. In this form, the mucous membrane of the bronchi is of a crimson, purple or of a deep brown color, rough and much thickened; the sub-mucous tissue is brown and loaded with

serous fluid, and the capillaries are much distended with dark-colored blood. The bronchial tubes, in fatal cases, are sometimes completely filled with thick, viscid mucus, adhering to the inner surface of the bronchial membrane, and causing a livid or marbled appearance of the serous surface. The lungs are generally dense and firmer than natural. These changes arise from the minute ramifying vessels at the termination of the pulmonary artery, and the organs of the pulmonary veins being unusually loaded with blood.

The morbid state of the capillaries of the œsophagus, stomach and duodenum are demonstrated by the furred or brown tongue, the thirst, the sense of internal heat, the loathing, squeamishness, and sometimes sickness with weight, oppression, and tenderness of the epigastric region; while the constipation of the bowels at the commencement, the insensibility to cathartics and occasional looseness at the termination, indicate the deranged condition of those of the intestines.

In the abdominal or intestinal typhus form of fever, the ileum and its follicles are greatly affected. The follicles become enlarged, elevated, prominent and swollen. The apices become dead and are thrown off in the form of sloughs, and in their place are left small ulcers, which soon enlarge, spread and increase in depth. In certain forms of fever, there are pain, distention and uneasy sensations in the right iliac region; and on percussion, a dull sound and a peculiar croaking noise are heard, and a gurgling movement felt beneath the fingers, as if produced by air and liquid, moving within the intestine. These symptoms continue the greater part of the duration of typhoid fever.

The portal vein constitutes, among the vessels of the digestive organs, a secondary capillary system, in which the blood is not less accumulated than in the primary one. This state of the capillaries of the portal and hepatic system is established by the appearance of the liver in persons cut off by fever. The spleen may suffer so much from this distention as to resemble a mass of clotted blood without trace of organization. This distention of the primary and secondary systems of the chylopoietic organs is most conspicuously demonstrated in the agues and remittents of warm climates, and especially in the severe and extreme form termed yellow fever. In the former, great nausea, and epigastric tenderness, with more or

less vomiting, are frequent, and in the latter constant symptoms. The vomiting at the commencement is always a watery fluid, which is soon followed by an admixture of blood somewhat darkened, which issues from the capillaries of the gastric and intestinal tissues. This exudation is at first scanty, but gradually increases as the disease advances, until it constitutes the greater part of what is discharged both by vomiting and by stool. This capillary organization is less frequent in bad agues and remittents, but in yellow fever it appears in its most aggravated form. In some severe cases of this disease, a dark-colored fluid of the same characteristics as those found in the intestinal tube, may be traced coming from the *pori biliarii* along the hepatic ducts. This, however, instead of being bile, is blood oozed from the hepatic capillaries. The capillaries of the urinary system are very much affected during fever. Bloody urine has been voided in both intermittent and continued fevers. In a similar way, those of the muscles, of the filamentous tissue, and of the skin are unnaturally distended. In short, there is scarcely a texture or organ of the animal body, in which the capillaries remain in a natural state in the different types of fever; throughout their entire system, there is more or less disorder. In individual cases, this derangement may be greater and more distinct in one set of capillaries than in another; but in such instances, it is always found that the affection of one organ does not entirely exclude that of another, and while the capillaries of one are very much affected, though those of the others are less so, they are by no means in a healthy condition.

An important question is to decide the nature of this affection. Many pathologists conclude that the morbid process of fever consists in inflammation. Against this supposition, however, various facts and arguments may be added; viz: —In fatal cases, unequivocal traces of inflammation are not uniformly found. The proportion in such marks as albuminous effusion, suppuration and ulceration, as observed, is small, compared with those in which accumulation of blood in the capillaries, and more or less disorganization of these vessels occur. In cases of pure inflammation of the internal organs, the concomitant symptoms, though febrile, are entirely dissimilar from those in either intermittent or continued fever. The marks or effects found in bodies cut off by fever are accidental complications, and may generally be traced to inflammatory action supervening on the

febrile process, owing either to the local weakness of the parts, the physical peculiarities of the individual, or the influence of external morbific causes. Inflammation is confined to the capillaries of one tissue, or at most of one organ and contiguous tissues, and while the structures and functions of the organ may be entirely impaired, those of others are natural, which is entirely the opposite in fevers. Inflammation gives rise to albuminous exudation, suppuration, ulceration, and in certain parts to serous or sero-purulent effusion, while in fevers the morbid state of the capillaries sends in entire destruction or disorganization of their organic extremities, and the consequent oozing of blood, from the surface of the several membranes and organs. And finally, though it may be regarded as established, that during the morbid process of fever the whole capillary system is unduly distended and overloaded with blood, moving more slowly and imperfectly than in health, yet we have no facts that enable us to determine what induces this accumulation.

The Condition of the Blood in Fevers.—An increase of fibrine in the blood does not exist as the result of fever. A marked diminution in all idiopathic fevers has been observed, and the red corpuscles and serum relatively increased. In typhoid and typhus fevers this diminution is much more decidedly marked. In malignant forms the blood sometimes is so deteriorated as to be unable to coagulate. This may partly depend upon a want of due arterialization in the lungs. These organs, in all cases of fever, are more or less deranged, their vessels are congested and oppressed, their action and that of the bronchial membrane are impaired, the air is admitted imperfectly into the bronchial tubes and their membranes; consequently there is insufficient arterialization. Again, if the opinion be correct that poisons diffused through the air are introduced into the blood through the lungs, and produce these diseases, it is not difficult to conceive of its mode of operation. If a poison exist in the air, it must be inhaled in the act of inspiration, and thus be thoroughly mixed with the blood of the lungs and circulated with it, and distributed through the whole vascular system to every organ of the body. Thus the poisonous material will have so altered the blood in the lungs as to produce in it a more decided effect than elsewhere. As the shock is first inflicted here, it is natural to suppose that they contribute largely to the loss of the power of coagulation. If these

views be well founded, it follows that when this altered blood is circulated, it must operate as a poison on the organs to which it is transmitted. Many of the phenomena of fever are similar to the effects of poison, particularly one at first irritant, and then sedative and narcotic. This appears to be the mode in which, towards the latter stage of fever, its cause acts on the brain, spinal marrow and blood.

The Anatomical Characters.—The anatomical character of the fever varies with the type of the disease. In intermittent, autopsy has shown traces of inflammation of the arachnoid membrane. The liver is frequently the seat of lesion, and sometimes undergoes a change of structure. In chronic ague it presents the appearance described by Dr. Craigie, caused by the congested condition of its capillaries. But, of all the organs of the body, the spleen is the most uniformly affected. It is not only changed in structure, but is very much enlarged, and in all fatal cases proves to be the principal organ on which the disease has spent its force. In remittent and congestive fevers the essential anatomical character is altered in the condition and structure of the liver and gall-bladder, although other organs, such as the spleen, lungs, brain, and we might add, the entire capillary system, at times manifest organic lesion and congestion. In typhoid fever the principal anatomical characteristic appears to be confined to the glands of the bowels. Dr. Bartlett states that the mucous membrane, exclusive of the elliptical plates and the isolated follicles, is, in a majority of cases, more or less changed in color. In many it is preternaturally red. The redness is sometimes continuous, and extends through a large proportion of the intestinal tract; at other times, and more frequently, it exists in patches or zones. Occasionally the color is grayish, particularly when the disease has been protracted to a late period.

The consistence of the membrane, like its color, is found in a moderate proportion of cases quite natural. Oftener, however, it is more or less diminished, sometimes so much so as to resemble an unorganized pulp, spread like a layer of paste over the subjacent tissue. This softening is in some cases quite simple; that is, it is not connected with any other appreciable alteration. In others, the membrane is at the same time reddened or thickened, or both. It is the opinion of Louis that these two forms of softening are un-

like in their character and causes. The latter he considers to be inflammatory; but the former depends on different causes, and is not the result of inflammation. In a part at least of the cases, he is inclined to regard it as the result of post-mortem or cadaveric change.

The invariable and characteristic lesion found in the small intestines, to which allusion has been made, consists in alterations, differing somewhat in different cases, of the *elliptical plates* or *Peyer's glands*. The condition in which these bodies are found varies with the duration of the disease, with the distance of the plates themselves from the ileo-cœcal valve, and from other circumstances, the nature of which is unknown. Without entering into so minute and elaborate a description of the several forms of this lesion, as has been very properly given in the original researches of Louis and Chomel, I shall enumerate the principal and more striking varieties.

In a small proportion of cases, consisting of those which terminate early, the elliptical plates, together with the subjacent cellular tissue, are merely increased in thickness, with redness and softening. This increase of thickness is such, that the edges of the plates have been known in rare cases to project to a distance of from one to two, or three lines, above the surrounding mucous membrane. Sometimes the hypertrophy of the plates and of the subjacent tissue is quite simple, the color and consistence of the membrane remaining unaltered. This simplest form of the lesion, that I am now describing, like all the others, which are more complex, is invariably found most advanced, and most strongly marked, at the lower extremity of the ileum. Each successive plate, as we go upward along the intestinal tract, from the ileo-cœcal valve, is less and less profoundly altered, till we arrive at those which are in a natural condition. The number of plates thus changed is various, sometimes extending to fifteen or twenty, and at others limited to one or two, and these always in the immediate neighborhood of the ileo-cœcal valve. Louis says, that in two-thirds of the cases the number of plates more or less altered, is from twelve to forty.

The surfaces of the thickened plates frequently present a granular, or finely mammillated appearance. The condition becomes very manifest when the gland is detached from its subjacent tissue, and held between the eye and the light. At other times, the surface

of the thickened membrane corresponding to the plates, is quite smooth and level.

In a great majority of cases, the plates, instead of being merely thickened, with or without redness or softening, are more or less extensively the seat of ulcerations, varying much in size and number. It frequently happens, for instance, that in proceeding downwards in our examination, after having passed over several places, we come to one in which there is a simple circumscribed ulceration, with perpendicular edges, extending more or less deeply into the thickened tissues. As we go on towards the termination of the intestine, the ulcerations become more and more numerous and extensive, till at last, for several inches next to the valve, the plates are entirely destroyed, and we find only ulcerations, corresponding to their size and shapes, occupying their places.

These intestinal ulcerations are commonly more or less regularly rounded, or oval in their shape. Sometimes, however, their borders are irregularly jagged and angular. Their edges are, in most cases, pretty regularly perpendicular and smooth, but sometimes they are ragged and shreddy. The bottoms of the ulcerations vary, of course, with their depths. They consist, sometimes, of the cellular tissue immediately under the mucous membrane; sometimes of the muscular coat, and again of the peritoneal covering. Occasionally this covering itself gives way, perforation takes place, and the contents of the intestine are discharged into the cavity of the peritoneum. Louis found this lesion in eight of fifty-five cases. Chomel quotes two instances of its occurrence in his clinique at the Hôtel-Dieu; in one of which, however, the perforation took place in the large intestine. The perforation is usually single, small in diameter, and near the termination of the ileum. In one of these cases, mentioned by Dr. Hale, it was at the distance of forty-four inches from the ileo-cœcal valve. It generally takes place at a late period of the disease. Perforation occurred in three of Dr. Jenner's twenty-three cases, respectively on the seventeenth, thirty-first, and forty-second day of disease. "The perforation of all three took place through the floor of an ulcer seated on one of the agminated glands. In two of the three, perforation occurred in the lower nine inches of the ileum; in one, three feet above the ileo-cœcal valve. In two of the three, the coats of the intestine were destroyed through their

whole thickness, at another spot from that at which the perforation, which proved fatal, took place; but the contents of the bowel had been prevented escaping through the aperture first formed by adhesion, in the one case, to the fundus of the uterus; and in the other, to a fold of the intestine. It will be observed that, in one of the three cases, certainly, the fatal perforation took place after the termination of the fever." It is a very singular fact, that this fatal accident commonly occurs in the course of very mild, or almost entirely latent forms of fever. This was the case in ten of twelve instances cited by Chomel. He suggests that the distention of the intestine by gas may frequently be the immediate cause of perforation. This seems hardly probable, since the greatest distention is usually confined to the large intestine, while perforation is most frequent in the small. It has occurred to me that the frequency of the accident in the mildest, and in some degree latent form of the disease, might possibly be occasioned by mechanical causes, especially by efforts of the patient while standing or walking.

This accident is much less common in children than in adults. Taupin met with it twice in one hundred and twenty cases, and Barthes and Rilliet only once in one hundred and eleven.

There is another peculiar appearance of the diseased plates, which is found in a certain proportion of cases; according to Louis, somewhat less than one-third. This seems to consist in a morbid change, or transformation of the submucous cellular tissue. Instead of being simply hypertrophic, with or without redness or softening, as in the cases already described, there is deposited in the tissue a substance of a yellowish color, destitute of any traces of organization, presenting a surface somewhat glossy when cut, and about as hard and friable as crude tubercle. The term *typhus matter* has been given to this morbid deposit.

After a careful examination and analysis of these lesions in twenty-three cases, the following conclusions are deduced:—

1. That ulceration of the solitary and agminated glands may commence in two modes: on the one hand, by softening of the mucous membrane, abrasion of the extremely softened superficial tissue, and then enlargement of the breach of continuity thus formed, in depth and extent, by simple ulceration; on the other by sloughing of a portion of the submucous tissue containing the before-described de-

posit, and of the mucous membrane over it, and then extension of the ulcer in breadth and width, by the separation of minute sloughs from the edges of the breach of continuity, left after the separation of the slough first formed.

2. That when the whole of the deposit has sloughed out, no fresh supply is formed; and that, consequently, as the whole of it is seated in the submucous tissue, destruction of the mucous fibres of the intestine must be the result of simple ulceration.

3. That resolution of the disease affecting the patches may, in some cases, occur before ulceration has taken place.

4. That ulcers of considerable force may heal.

5. That no contraction follows the healing of ulcers within a short period.

6. That ulcers dependent for their origin on the presence of poison in the system may, after the fever has run its course, continue to spread, retard recovery, and even cause death by perforation.

7. That while some of the ulcers are undergoing the healing process, others may be spreading, or as Robitansky says, may pass into the state of atonic ulcers.

On summing up the locality of fevers, we may reasonably infer that the intermittent form is intimately connected with a deranged condition of the spleen, while the remittent and congestive spend their force upon the liver and stomach, and the typhoid upon the bowels. Yet it is contrary to the universal characteristic of all forms of fever to confine their anatomical and physiological changes to any definite boundary, as each and every organ of the body is necessarily more or less dependent upon the entire organism, which constitutes the whole. So disease, although local in its incipiency, soon extends its abnormal influence to nearly, if not every tissue of the body.

On making post-mortem examinations, it must be borne in mind that the anatomical changes observed are not always the result of diseased action, from the fact that but very few, if any, fatal cases of fever occur without the patient receiving more or less medical treatment; and it is well known that nearly, if not all the medicines used in the treatment of disease, are susceptible of producing changes in the various tissues of the body, and that they frequently play an

important part in the organic change of various tissues will hardly admit of a doubt. Hence, in order to estimate the full effect of disease upon the different organs and tissues of the body, we must take into consideration the influence of the various remedies used in its treatment.

I have been forcibly struck, in clinical lectures and autopsic examinations, in this city, by many of my colleagues in various hospitals and medical schools, to observe that they ascribed all the organic lesions, as well as morphological changes, to the influence of the materies morbi producing the disease; while I have been satisfied that many of these pathological conditions were the result of medical agents. In some recent experiments that I have made with the mercurials, tartar emetic, iodine, bromine, and other agents, I am satisfied that the mercurials, in particular, when administered for any considerable length of time, are liable to produce inflammation, ulceration, and sloughing of the elliptical patches of the mucous membrane, and hyperæmia of other glands, organs and tissues of the body. There is nothing more frequent than to find congestion of the spleen, liver, mucous membrane of the stomach, and ulceration of the fauces, an alteration in the chemical constituents of the blood after a moderate mercurialization of two or three weeks, even although the animal was not afflicted with disease. Thus, a dog, to which I administered three grains of mild chloride of mercury, every day for fourteen consecutive days, upon being killed, and examining the mucous membrane of the stomach and bowels, was found ulcerated in patches, with general enlargement of its glandular structure. The liver, spleen and lungs were also in a state of congestion.

SECTION V.

VEGETABLE MIASMATIC FEVERS.

INTERMITTENT FEVER, OR AGUE.

This disease is characterized by febrile symptoms, occurring at regular intervals of longer or shorter duration. The intervening period between the paroxysms is the apyrexia; that, from the commencement of one period to the end of the next, the revolution. The fever assumes three types ordinarily:—the *quotidian*, the twenty-four hour; *tertian*, the forty-eight; and the *quartan*, the seventy-two. These are liable to numerous diversities. The quotidian is frequently double, having two paroxysms daily; and the same may occur in the tertian and quartan every second and third day.

These varieties have their anticipating and deferring characteristics; for instance, the paroxysm may occur one hour earlier every day, or be deferred an hour later, and this may continue until an entire revolution is effected in the period of the paroxysm. The quotidian, or twenty-four hour type, usually occurs in the morning, the tertian ir the afternoon, and the quartan during the night.

The cause of these fevers is supposed to depend upon the influence of malaria, a poison emanating from vegetable matter, when in a state of decomposition. Although, under ordinary circumstances, this appears to be the case from all known facts, yet evidences are not wanting to prove that vegetable decomposition may occur very extensively without emitting this poison. There are certain conditions, however, under which the so-called malarial fevers make their appearance; and although it has not been demonstrated whether these circumstances derange the organism and produce the disease, or whether there is a specific poison generated, yet the doctrine of malarial influence is generally received

to be correct, although its mode of development and physical and chemical characters are unknown. The circumstances under which it is supposed to generate, are its appearances in low and moist localities. It is never developed below the temperature of sixty degrees, Fahrenheit; thirty-two degrees destroys its activity; and it is most virulent as we approach the equator. It accumulates in goods, ships, etc., and is thus transported and carried a long distance by the air. It is frequently developed in previously healthy places by turning up the soil, and clearing the lands of new countries. Water absorbs and transmits it to the system. It is confined to certain localities, near the surface of the earth, and is more abundant during the night. In sleeping in the upper stories of houses, one is more liable to escape from its influence. The period of incubation is uncertain, depending entirely upon collateral circumstances. If the person exposed be of feeble habit, or his system debilitated from fatigue, hunger, or other causes, he is easily impressed by the miasma, and the pathognomonic indications of its influence are soon manifested. From recent investigations, it is believed that the miasm results from putrefactious fermentation, communicated by allotropism. This is inferred from the fact, that in marshes, and in all low lands, the growth of microscopic algæ is very extensive and rapid, and that it must affect the normal constituents of the air. If this be true, putrefaction and fermentation may begin with the growth and decay of minute vegetable life, and communicate their influence to living organisms, thus establishing in the system the germ of putrefactive fermentation. These algæ germs, once planted, may become developed and transformed, until the organ, or part of the system upon which this vegetation occurs, be a perfect magazine of miasm. Again, these formations may accumulate in cellars, pools of water, and filthy sewers, and by the influence of heat, become converted into a reservoir of poison, which, by a blast of wind, is diffused over the city, distributing its poisonous influence, and producing intermittent, remittent, yellow fevers, etc. Future observations may more fully develop this subject.

Symptoms.—Each paroxysm of an intermittent, when regular and fully developed, consists of three stages; viz:—the *cold*, *hot*, and the *sweating*. The attack is frequently preceded by feelings of

languor or weariness, irritability of the nerves, impaired appetite, imperfect circulation, cold extremities and pain in the head and back. Gradually the circulation becomes more tardy, there is more stretching, yawning and languor, till finally the blood recedes from the extremities and surface of the body, producing internal congestion, which is followed by a chill. During the cold stage the skin becomes pale and contracted, frequently representing the rough appearance called goose-skin, or cutis anserina, the extremities are shrunken and cold, the features contracted, and the lips and tips of the fingers often purplish or somewhat livid. Respiration is hurried and irregular, and there is an oppressed feeling in the epigastrium, and sometimes there is a hacking cough. The tongue is pale and moist, though usually there is great thirst. There is anorexia, occasionally nausea, and vomiting of ingesta, mucus and bilious matter, probably owing to sympathy of the stomach with the brain. The pulse is small, and quick in some instances, in others irregular and feeble. The nervous system is very much impaired. There are often severe neuralgic pains in the back, loins, extremities and head. The temper is somewhat irritable, and the mind confused, dejected, and sometimes wandering. Occasionally there is stupor, coma, and even symptoms of apoplexy. The secretions are usually scanty, and the urine pale, limpid and copious. Thus the symptoms of the cold stage are developed, varying more or less in different cases from a period of a few minutes to several hours.

The passage from the chill to the *hot* stage is not abrupt. Gradually the skin becomes hot and dry, the cheeks are flushed, the eyes sparkle, the surface is every where reddened, and the skin distended with blood. The mouth is hot and dry, the tongue furred, and the patient generally complains of intense thirst. All food is rejected, and there is nausea and vomiting. The respiration is free and quick, and the pulse more frequent than in health, and usually full and strong. The secretions are diminished, and the urine scanty, and sometimes high-colored. There is usually pain in the head, back and limbs. It is frequently throbbing, with a distended feeling in the temples, and appears to be deep in the head, unlike that of the chill, which is generally superficial. At the commencement, convulsions are not uncommon, and occa-

sionally there is a moderate delirium. A petechial eruption often appears and disappears with the fever. After this reaction has ensued from two to eighteen hours, it is followed by the *sweating* stage.

The perspiration usually appears first upon the head and face, or breast, and gradually spreads over the entire body. It is generally copious, but may be slight or very profuse. Upon its first appearance, the patient feels relieved, and the febrile excitement gradually disappears as it advances. The skin becomes cool by the evaporation from the surface of the body. The mouth is moistened, the pulse becomes soft, but retains its fulness, the headache disappears, and the urine, though high-colored, usually deposits a pale, reddish sediment. Thus, gradually this stage passes by, and by the heart and arteries returning to their natural degree of activity, and the free action of the skin and other secretions, a state of perfect apyrexia ensues. During the intermissions, there is usually in simple intermittents no fever, but rather a feeling of languor, there is an unnatural sensitiveness to cold, the countenance is pale, but the appetite generally good.

Such is generally the course of intermittent fever. But in some instances we have, instead of the cold stage, a general numbness, without much coldness, and sometimes the sweating stage is deficient, the fever either gradually subsiding without any discharge, or in the place of the perspiration, diarrhœa, or a copious flow of urine occurs.

Simple intermittent fever is very uncommon, if there be no complications at first, they often occur very soon, as the *inflammatory*, *gastric*, *congestive* and *malignant*. *Inflammatory*, when the fever is of sthenic form, with a strong reaction, a full vigorous pulse, a florid surface, and a pure rich blood; *congestive*, when asthenic, with unusual depression of chill, a slow and uncertain reaction, feeble and frequent pulse, a dusky or purplish hue of the skin, and a depraved or impoverished condition of the blood; *gastric*, when the miasm which operates through the blood is slow in developing the fever, therefore deranging the digestive apparatus; and *pernicious* or malignant, when the powers of the system are so much prostrated by the extreme concentration of the miasmata as to endanger a rapid and fatal issue.

Ague is always more or less pernicious, producing often a variety of diseases. Apoplexy, aneurisms, paralysis, neuralgia, or congestion of the spleen, and dropsy is often the result. Attacks of insanity have been known to follow, and sometimes the catamenia, lochial discharges, and the secretion of milk in women, and the habitual hemorrhoides in men have been suspended. Although intermittents are generally so injurious, yet occasionally they are beneficial by superseding other affections, and removing morbid tendencies which had resisted treatment. Nervous diseases, as neuralgic affections, epilepsy, hysteria, asthma, dyspepsia, rheumatism, are removed frequently in this way.

Diagnosis.—Intermittents may be confounded with hectic and remittent fevers. The former is distinguished by the irregularity in the recurrence of the paroxysm, the comparative absence of headache, the excessive night sweats, the clearer complexion and brighter eye, the frequent absence of gastric disorders, the continued frequency of the pulse during the apyrexia and the serious organic diseases of which the hectic is usually a mere symptom. Remittent fever is only distinguishable by the continuance of the fever during the interval.

Prognosis.—In the uncomplicated forms the prognosis is usually favorable. It is possible that death may ensue from cerebral or pulmonary apoplexy. Inflammation of any of the vital organs gives rise to danger, proportionately to the parts involved, and the degree of violence. In the congestive and malignant forms, delirium, coma, œdema and passive hemorrhages are always unfavorable. The more complete the interval, the more easily may the disease be checked. The postponement of the paroxysm by two or three hours or more at each recurrence is always favorable. Of the different types, the tertian is the easiest, and the quartan the most difficult generally to cure.

Treatment.—The treatment of intermittent fever may be divided into four stages. First, that which refers to the prevention of the disease; second, the treatment in the cold stage; third, that during the pyrexia or hot stage; and fourth, that during the sweating stage and apyrexia.

The preventive treatment consists in the maintenance of as near a standard of health as possible, by a well regulated diet and regi-

men. Sleeping in the upper apartment of houses in malarial districts, and the closure of doors and windows on the side exposed to marshes, together with occasional diuretics and mild purges, to maintain proper energy on part of the liver and kidneys, will contribute largely in the prevention of the disease. When the system is contaminated by the malarial poison, an occasional dose of sulphate of quinine may prove serviceable. When the fever occurs, and the patient experiences rigors and chills, the feet should be immersed in hot water, friction and chafing liniments applied to the spine. He should then be placed in bed, covered with warm clothing, jugs of hot water applied to the feet, and large draughts of warm water or balm tea drank freely. When the stomach is vitiated, it should be evacuated by means of a mild lobelia emetic, and when there is constipation of the bowels, they should be opened by warm water enema or mild purges. If there be extensive congestion of the liver or spleen, hot packs should be applied, or the patient may take an alcoholic spirit sweat or vapor bath. In some instances, where there is extensive internal congestion, especially in malignant agues, I have found it serviceable to administer an entire hot pack. This can be done by wringing a blanket from hot water, wrapping it around the patient, placing him in bed, and covering him with quilts. If there are indications of cerebral congestion, cold packs may be applied to the head, sinapisms to the spine, chafing liniments and hot jugs to the extremities.

Hot Stage.—As soon as the cold stage has passed, and re-action commences, the extra clothing, the sinapisms, and every thing which tends to augment the fever, should be removed. The surface should be frequently sponged with tepid water, to which a little soda has been added. If the stomach and bowels have previously been properly evacuated, and the fever be of a sthenic character, half a dram of the essential tincture of veratrum viride may be added to four ounces of water, and a teaspoonful administered every five or ten minutes until the febrile symptoms subside. In malignant intermittents, where the re-action is violent, larger doses may be given; and if the fever be of an asthenic character, tincture of aconite, in very nearly the same proportion, may be administered. If these remedies should fail to interrupt the progress of the fever, the following compound should be administered:—Take essential

tincture of lobelia inflata, scutellaria latifolia, cypripedin pubescens, of each one fluidounce. Mix. Add one ounce of the compound to six ounces of water, and give a teaspoonful every ten or fifteen minutes, until the fever is subdued. The above mixture forms one of the most powerful and reliable anti-febrifuges and intermittent preparations with which we are acquainted. Where there is a morbid condition of the stomach, and a sluggish, congestive state of the liver, we have found it of great service to administer this preparation until it is followed by nausea and vomiting. The object of all these remedies is to control the fever, lessen arterial excitement, and equalize the circulation. The sponging of the surface is an artificial perspiration, evaporating the heat, and lessening the temperature of the body, thus controlling the fever until the antispasmodics can overcome the spasms of the peripheral capillaries, and establish those normal transformations from the surface, which maintain the proper temperature of the body. The object of the practitioner should be to cut these stages as short as possible, and thus procure more time for the radical treatment.

Stage of Perspiration.—During the stage of perspiration, as well as that of the entire interval between the paroxysms, the main object of the physician should be to administer remedies to prevent the recurrence of the disease. The remedies capable of interrupting the paroxysms, are known as antiperiodics. Among the most potent of these are the preparations of cinchona; as well as strychnin, sulphate of bebeerine, prussic acid, cornin, salicin, chloride of sodium, most of the mineral acids, arsenic, and other mineral and vegetable substances. A very erroneous opinion has prevailed relative to the character of drugs possessing the power to prevent paroxysms of ague. It has been supposed that all these agents were tonics; hence the most active tonic was considered the most potent to prevent the paroxysms. So far from this being the case, some of the most active tonics possess no controlling influence over the periodicity of disease. This is especially the case with hydrastia, hydrastin, quassia, and many others equally as valuable. The most reliable remedy with which we are acquainted as an antiperiodic, is sulphate of quinia, of which, in an ordinary intermittent fever, from ten to forty grains are required to arrest the progress of the disease. The quantity must depend altogether upon the

amount of malarial poison with which the system is contaminated, as we apprehend that the *modus operandi* of the drug, in the cure of this disease, consists in its power to combine and neutralize the poison producing it. Thus I regard it an antidote to malarial poison. This is also the case with other preparations of the cinchona, as the sulphate of cinchonia, chenoidine, etc. In mild cases, I am in the habit of combining ten grains of sulphate of quinia with thirty grains of ferri ferrocyanuretum. Divide into five or six powders, and administer one every two or three hours, so as to have them all taken during the apyrexia. In more severe forms, larger doses may be administered, and repeated at shorter intervals; and if the sedative impression of the poison has partially paralyzed the influence of the nerves and absorbents, much benefit will be derived by adding from one-half to one grain of piperin or capsicum to each dose. If the first effort should not be successful, and the paroxysms be repeated, more energetic measures should be resorted to during the second interval; and even, in some cases, large doses of quinia, from five to twenty grains, have been successfully administered immediately upon the approach of the paroxysm. In some cases, strychnin, prussic acid, xanthoxylin, and sulphate of bebeerine, have been compounded with the quinine to advantage. The compound, termed Ague Mixture, in my work on New School Medicines, has been most successfully used as an antiperiodic in nearly all forms of remitting and intermitting fevers. After the paroxysm has been interrupted, the physician should direct his attention to such organic and functional disturbances as are manifested during the progress of the disease. If the liver be inactive, either from congestion of the portal circle or parenchymatous hyperæmia, small doses of leontodin and leptandrin may be administered at proper intervals, until the difficulty is overcome. If there be constipation of the bowels, a fluidounce of equal parts of the compound syrup of rhei et potassa and essential tincture of leptandria Virginica, administered as a purge, will remove the difficulty. Where there is inactivity of the kidneys, from one-eighth to one-fourth of a grain of apocynin should be given three or four times a day. The next duty is to attend to the consecutive developments of the disease. In simple quotidian ague, the relapse or re-occurrence of the paroxysm usually occurs on the seventh day; while the tertiary occurs on the

fourteenth day, and the quartan on the twenty-first. Thus the twenty-fourth, the forty-eighth, and seventy-second hour types have the periods of incubation in seven, fourteen, and twenty-one days, which are usually followed by the outcropping of the original symptoms or paroxysms. To prevent these relapses, a full antiperiodic should be administered, from ten to twelve hours previously to the anticipated attack; and where the patient is constantly exposed to malarial influences, an occasional dose of sulphate of quinia, to neutralize its effects, together with frequent baths, mild purges, diuretics, and tonics, will contribute much to prevent the outbreak of the disease.

REMITTENT FEVER.

Remittent fever differs from intermittent, in the severity of the paroxysms, and the persistency with which the fever manifests itself during the entire revolution. In intermittent fever there is a period between the paroxysms in which the febrile symptoms are not present; but in remittent, although there is a marked decline in the temperature of the surface, yet there are more or less indications of fever during the entire existence of the disease.

Symptoms.—The symptoms of the forming stage are very similar to those of intermittents. A loss of appetite, bitter taste in the mouth, foul breath, scanty yellowish urine, constipation of the bowels or diarrhœa, drowsiness, headache, pain in the back, restlessness and general prostration of the system. The disease generally commences with sensations of chilliness, amounting often to rigors, and coldness of the extremities. The face is usually pale, and the lips purplish. The pulse is small, depressed, and frequently irregular. The chill is seldom as severe, or long continued as in intermittent fever, varying from a few minutes to an hour. As the fever becomes established, the patient feels uncomfortably warm, the skin is hot and parched, the surface generally somewhat reddened and expanded, the respiration hurried, and the pulse more frequent and full, beating from 120 to 130 per minute. The tongue becomes covered with a brownish or yellowish fur, nausea, and generally bilious vomiting occur, during the first day of the febrile excitement. Thirst is a very frequent symptom. The face is usually flushed, and the eyes suffused, and the patient almost always complains of headache, which is often

severe, tensive or throbbing. A sense of weight is generally felt in the right hypochondrium and epigastric regions, and sometimes a dull pain.

Though seldom delirious, the patient is restless and wakeful. When not delirious, there is always great muscular weakness. The bowels are slightly distended, and tender to the touch. These symptoms continue without abating for some time, generally from six to eighteen hours, after which they begin to relax, with the appearance of moisture about the neck and face. The whole body soon is covered with a gentle perspiration, and the patient experiences so much relief that he usually falls into a quiet sleep, from which he awakens refreshed and improved. The headache, thirst, and nausea have greatly abated, or quite disappeared, the pulse is nearly natural, the skin is cool and soft, the tongue is somewhat cleansed, and the food received without disgust. This is the remission, lasting in some cases, not more than two or three hours, in others, a whole day, according as the type of the fever may be quotidian or tertian. Another paroxysm then occurs, sometimes like the first, commencing with a chill and subsiding with perspiration, but frequently also without either one or the other. This ends in due time in another remission, and in this way the fever continues with regular revolutions of exacerbations and remissions, each exacerbation becoming generally more severe and protracted, and each remission less decided and shorter, until it either terminates in a crisis, and convalescence, or else assumes a more uniform or continued character.

This is the ordinary course of a bilious remittent fever. Though mild at the commencement, remittents may assume an aggravated character, if they continue over nine or ten days. The tongue becomes more loaded with a brown fur, and is dry in the middle, the skin assumes a deeper tinge of yellow, debility becomes more conspicuous, the bowels are more distended and very tender, and frequently restlessness and almost constant delirium occur. If the fever continues beyond the tenth or twelth day, there is very great prostration, and it is more continuous. The skin too becomes very hot, and assumes more of a yellowish hue, or else dark or bronzed. The tongue is brownish or blackish, especially in the centre, the eyes become red, the urine of a dark reddish brown color, or entire-

ly suppressed, the alvine evacuations reddish and watery, and generally there is a tympanitic state of the abdomen, and hemorrhages frequently occur.

Causes.—The causes of remittents are the same as those of intermittent fever. Remittent fever is also produced by intestinal worms, without any aid of a miasmatic agent.

Diagnosis.—The following may be considered as the most characteristic phenomena by which remittent fever can generally be distinguished:—The regular paroxysmal character, and inclination to commence and terminate in intermittent fever; the epigastric uneasiness and irritability of stomach, so prominent in many instances throughout the complaint; the almost constant symptom of pain or uneasiness in the head; and the evidence of excess of bilious production, shown in the vomiting and purging of bile, the yellow skin and eyes, and the jaundiced urine. Other circumstances, which will materially aid the diagnosis, are the season of the year, the place where the disease may have been contracted, the exposure, and the time that may have intervened since the exposure.

Anatomical Characters.—Signs of inflammation of the meninges of the brain, and congestion of that organ, are frequently noticed. The mucous membrane of the bowels is also inflamed. The lungs are frequently congested, and the heart sometimes softened and flaccid. But there is nothing peculiar to remittent fever in these phenomena. The liver is often enlarged, and more or less softened, but inflammatory symptoms are very seldom found. The most striking phenomena revealed, is a loss of its reddish-brown color, and the substitution of a bronze or slate upon the external surface, and of a uniform olive or bright bronze upon its cut surfaces. The spleen is generally enlarged, sometimes more than five times its usual size. It is also softened, so much so, sometimes, as to be pultaceous, and to resemble loosely-clotted blood.

Treatment.—In the treatment of this disease, the essential indication is to reduce the fever to the primitive type, of which intermittent fever is the representative. To accomplish this, an active lobelia emetic, followed by a hot bath, vapor bath, or sponging with hot water, together with a mild purge in the onset of the disease, will contribute much to the result. Where the exacerbations are not jeopardizing the safety of the patient, they should be followed

with the intermittent mixture, the tincture of veratrum viride, or of aconite, until the febrile excitement is entirely controlled, or an intermission is produced. As soon as this is accomplished, antiperiodics, such as sulphate of quinia, sulphate of cinchonia, or some of the antiperiodic compounds, should be administered in quantities sufficient to interrupt the periodicity. In cases, however, where the paroxysms are severe, and frequently repeated, the antiperiodic may be administered, either in combination, or at the same time with the intermittent preparation. Thus, five or ten grains of sulphate of quinia may be compounded with the one-twentieth or one-sixteenth of a grain of veratrin, or with fifteen or twenty drops of the intermittent mixture. These doses may be repeated at intervals of every two or three hours, until the fever and paroxysms are controlled. In malignant cases, where the sedative influence of the malarial poison partially paralyzes the nervous system, the powers of the stomach frequently become so enfeebled as to prevent the absorption of the remedies. In this event, stimulants should be added, such as capsicum, xanthoxylin, piperin, or carbonate of ammonia. Where the disease is more advanced, and there are typhus symptoms, one or two drops of prussic acid, or the twentieth part of a grain of strychnin, may be administered in connection with the sulphate of quinia; and I have found that by compounding the quinia with the hypophosphite of iron, it frequently proved more potent as an antiperiodic; besides, the iron prevents that dyscrasia of the blood, which frequently occurs in the disease. Where there is local congestion or inflammation as a complication, hot packs should be applied; and if there be hepatic derangement, as hyperæmia or inflammation, small doses of muriate of ammonia, leptandrin, and leontodin, should be frequently given. If there be nausea and vomiting, as frequently occurs in this disease, from one-half to one grain of baptisin will usually arrest it. Where this fails, I have generally succeeded by adding five drops of creasote to six ounces of water, and administering a teaspoonful every fifteen or twenty minutes. Where there is cerebral congestion, cold packs or ice may be applied to the head, and sinapisms and jugs of hot water to the feet. If the first effort to subdue the paroxysm be not successful, the antiperiodic should be repeated upon the appearance of the slightest remission; and even in cases threatening danger, they may

be administered in combination with the oleo-resin of lobelia during the height of the paroxysm. Where there is great emergency, I have found the following compound most admirably adapted to arrest the paroxysm, and interrupt the periodicity of the disease:—Take quiniæ sulphas, twenty grains; ferri ferrocyanuretum, one dram; oleo-resin of lobelia, three grains. Mix. Form twenty powders. Dose.—One to be taken every hour. After the fever and paroxysms are controlled, all complications and local difficulties should be removed, and the patient placed upon a nutritious diet, and such tonics as hydrastin, iron, alnuin, etc. Where the patient is exposed to a perpetual malarial influence, the preventive antiperiodic treatment should be administered, as in intermittent disease, every seven, fourteen, or twenty-one days, according as the disease is quotidian, tertian, or quartan.

TYPHUS FEVER.

Typhus Fever. Hospital Fever, Jail Fever, Camp Fever, Malignant Fever, Putrid Fever, Congestive Fever, Ship Fever, &c. There is, perhaps, no fever that is so illy defined, and relative to which practitioners have so much diversity of opinion, as regards the classification, nature, and character, as that of Typhus. A class of very respectable writers regard this fever as an idiopathic affection; while others of equal ability and notoriety regard it as a condition, or one of the dependencies of bilious remittent fever. Among the former are Drs. Gerhard, O'Brien, John Cheyne, Jenner, Upham, Flint, Bartlett, Wood, Copland, &c.; among the latter we may mention Drs. MacIntosh, Armstrong, and I. G. Jones. Dr. Gerhard, of this city, has published the history of an epidemic fever which prevailed here in 1836, which he regards as identical with typhus, which has been so elaborately described by many European writers; and especially of that described by Drs. Barker and Cheyne as the great Irish epidemic typhus fever which prevailed in 1817, '19. In the description of the Philadelphia epidemic, as published by Dr. Gerhard, we cannot discover that the disease differed, in any essential degree, from the malignant forms of malarial fevers which have prevailed so generally throughout the United States, when modified by a vitiated state of the fluids, a feeble vitality, and the addition of animal effluvia. Dr. Gerhard mentions that the attack of the fever was usually

preceded by lassitude, debility, and loss of appetite; that it was ushered in by rigors and chills, and that during its progress it was characterized by frequent exacerbations and declines. The only symptoms which appeared to distinguish this fever from the ordinary congestive form of the Western, Southern, and Middle States, were the more violent of enervation, such as great nervous prostration, early delirium, &c. Of this fever Dr. Copland remarks:—"That it is *characterized* by phenomena which distinguish it from the foregoing varieties, by *catarrhal and gastric symptoms early in the disease;* by *stupor*, *delirium*, or *typhomania;* by *a peculiar cutaneous eruption;* by *more or less evident affection of the liver*, and by *the determinate course and regular succession of all the febrile changes. True*, or *contagious typhus*, has been confounded with *synochoid* and *nervous fevers*, on the one hand, and with *putrid* or *malignant* on the other." It has been already stated that putridity, or malignancy, not only may characterize a particular form of fever, or certain epidemics, even at an early period of their course; but also, owing to various contingencies, may take place in advanced stages of any other fever. As the circumstances favoring the generation and spread of typhus, are often such as also to develop those changes which have been usually named putrid or malignant; and as these are frequently observed in the latter stages of typhus, the symptoms distinguishing this fever becoming associated with, or followed by those indicating the putro-adynamic state, so it has been often confounded with other fevers, in which this state has predominated, more or less. If we refer to the numerous histories of epidemic typhus recorded by writers from the close of the fifteenth century up to the present time, or even to the brief abstracts furnished by M. Ozanam, (*Hist. Med. des Maladies Epidermiques*, &c., *et seq.*,) we shall find, that although many of these, owing to the concurrence of circumstances developing a putrid or malignant disease, were instances of fever, either identical with, or very closely resembling that which I have described as typhoid, yet many others, or even the majority, were true typhoids, in which the putro-adynamic state was either early or prominently developed; the exanthematous eruption characteristic of typhus being succeeded or accompanied by the petechiæ indicating the approach of the septic condition, and being either

mistaken for them, or an eruption .of malaria. Owing to this circumstance especially, typhus, low nervous, and putrid fevers, have been very generally confounded. The essential characters of typhus fever were first distinctly traced by Sauvages; but Cullen mixed them with the symptoms of those forms of low nervous or typhoid which occur sporadically. Even among modern writers, comparatively few have made the distinction, excepting Hildebrand, Fodere, Naumann, Peebles, and some others. True, or contagious typhus, has not been epidemic for many years; or, if it has appeared in a few places, it has not extended beyond them. In Ireland, however, it was extensively prevalent, particularly in the years 1817, '18, and '19; and in some parts of Scotland since that time. The fevers most commonly observed in England, and particularly in London, have been either synochoid, simple or complicated; or of a low nervous form, variously associated, and but rarely displaying a predominance of putrid or septic character. During 1836, '7, '8, '9, this fever was very prevalent in London, and in several other places.

True typhus, although prone to assume a septic condition, especially when epidemic, and appearing under the unfavorable circumstances about to be noticed, yet may run its whole course without petechiæ, or any marked putrid symptom. It may, as shown by Hildebrand, be simple, or variously complicated; and, as remarked by Dr. Peebles, may be benign throughout, or assume a malignant character, according to individual diathesis, the nature of the prevailing epidemic, or the mode of treatment. It generally presents itself as an epidemic, is contagious, and runs a uniform course, unless a predominant affection of some internal organ modifies it, or prolongs its duration. It has been shown above that the *petechial affection* consists of small stains, or ecchymoses, caused by the transudation of blood from them inute capillaries of the vascular *rete* of the skin, owing to the atony of these vessels, and the alteration of the blood; that it may occur in the advanced stage of any fever, even of the more inflammatory, or purely eruptive, when converted into an adynamic or typhoid state, by improper treatment, or the peculiar condition of the patient; and that it is not, in any sense of the word, an *eruption*, as it has been very improperly denominated by some writers. This change in the skin,

which has been viewed as one of the chief indications of incipient putridity, or of a septic tendency, is very different from the eruption characterizing typhus. The *petechiæ*, or cutaneous ecchymoses, vary in dimensions from minute *stigmata* to large patches of *vibices*, and in the deepness or shade of color. They very rarely appear at the commencement, even of the more putrid or malignant fevers, unless from peculiar depravity of constitution, or from causes affecting more especially the circulating fluids, as impure air, imperfect nourishment, unwholesome food, or other injurious ingesta.

But the *exanthematous* eruption attending true typhus is as characteristic of it as the eruption of measles or of scarlatina; and, although observed by numerous writers, it has been confounded with petechiæ, with which it is often associated in the advanced stages of the fever, or with miliary eruptions. Hildebrand gave a description of it, as it appeared in the contagious fevers prevalent in Germany during the commencement of the present century; and Dr. Peebles has recently described it accurately and minutely, as he saw it in Italy soon after the war. This eruption appears in the early progress of a fever produced by human effluvia, when circumstances occur to promote them, or to prevent their dissipation. The animal miasm, whether generated by numbers crowded in a small space and confined air, or proceeding from a person affected by the disease, should be viewed as a poison affecting the human body in a specific manner, and causing fever with an eruption of a certain form, which propagates itself by the diffusion of a morbid effluvium in the surrounding air, or by its retention in various animal productions, or porous substances, when shut up from the air.

This eruption usually appears from the third to the seventh day of the fever, but it may be delayed till the twelfth or fourteenth. It is of a florid, reddish, or reddish-pink color; disappearing on pressure, but soon returning when pressure is removed. This circumstance is sufficient to distinguish it from petechiæ. The more exuberant, resembles the measles, and has been mistaken for them; but it is more papillar, and rougher to the touch, being sensibly elevated to the eye; and, although sometimes grouped or crowded, it does not coalesce as much as measles, but each papilla is more or less separate. It is sometimes vesicular, and followed

by desquamation of the cuticle. It is occasionally indistinct, and may be then overlooked, and sometimes approaches more nearly the miliary eruption. Hence it has been mistaken for this eruption in such cases. It is generally confined to the trunk, the arms, and thighs, but it may cover nearly all the body. It rarely extends over the face or hands. In children it appears only on the trunk, or parts of it, and often scantily. It is sometimes evanescent, disappearing in one part of the body, and returning in another. It may be copious in some cases, and scanty in others, even in the same family. Owing to these circumstances, it may escape observation. It is not liable to recede early in its course; but if it disappear from injudicious treatment, or a faulty state of the system, malignant symptoms are apt to supervene.

In some cases, the interstices of the skin between the papillæ are red, or erythematous. In these there is also increased suffusion of the eyes, redness of the tongue at the point and edges, and of the fauces, as in mild scarlatina, and subsequent desquamation of the cuticle. The above is the ordinary type of typhus, and it will be noticed, almost exactly corresponds with that which I have given of typhoid. The nature, character, and progress of the eruption, together with the erythema, closely resembles that of the typhoid which I have so uniformly observed during its progress in nearly all sections of the United States for the last twenty years, that we can but conclude that the disease has been confounded with the true typhoid of this country; that typhoid fever becomes essentially modified by the combined influence of animal and vegetable miasm, we have the most ample proof. In malarious districts where intermittents and remittents are prevalent, typhoid fever, in addition to its ordinary progress and symptoms, not unfrequently manifests all the symptoms peculiar to aggravated remittents. Again, in crowded cities, hospitals, barracks, and other situations, where large bodies of people are congregated, the zymotic effluvia may coincide with the typhoid poison, and so modify the disease as to embrace all the symptoms and characteristics which have been so elaborately described by Hildebrand, Copland, and others, under the head of typhus. Another form of fever, which has been minutely described by many writers, and which Dr. Armstrong has so thoroughly investigated, is unquestionably a modification of con-

gestive or remittent fever, produced by the same zymotic influences. That Dr. Armstrong, in his investigations, confined his observations to the modifications of remittent fever produced by this idio-miasmata, we have the most ample evidence in the following synopsis of his statements:—

My former belief was, that typhus fever arose from human contagion. But I have lived to feel it a duty incumbent upon me entirely to alter that opinion. The following case affected me deeply, and first led me to review my opinion on the subject, the opinion, I mean, which I then entertained with regard to the origin of typhus fever:—

About six years ago, shortly after I had published the third edition of my work on typhus fever, in which I had strenuously maintained the doctrine of human contagion, I met with a case of intermittent fever. In a few days the fever became remittent, and soon assumed the continued character, and the patient died with all the most malignant symptoms of typhus.

This case made a powerful impression on my mind; and I could not help asking myself whether it was not possible that the common ague of this country, the marsh remittent fever, and continued typhus fever, might be one and the same affection, modified by certain circumstances. I determined, at any rate, to re-investigate the subject; for I suspected I might have taken up as a prejudice, at college, the doctrine of contagion, and might have acted on that as a sacred truth. Few men have more contemptuous views of black-letter learning, and the dogmata of schools; yet the opinion clung to me closely, and I parted with it gradually, if not with regret. I investigated the subject afresh, resolved, if possible, to arrive at the plain truth, whatever it might be; and in six years the result has been, that I am perfectly convinced that what is commonly called typhus fever does not arise from malaria, or marsh effluvia; that it is intermittent, remittent, and continued; that it arises from infection; and that it does not originate from human contagion. It should be remembered that infection is not contagion. It is a state of atmosphere produced by the surface of the earth, and the air, which is limited to a certain space; and persons breathing it are subject to certain modifications of as imilar disease.

It is a very humiliating thing to the human mind to detect long established error; but it has these two advantages:—it gives a man the satisfaction of possessing the truth at last; and makes him more cautious in the admission of prejudices for the future.

Nothing can satisfy the human mind, which contemplates the phenomena of nature around it, but the conviction of possessing the truth. The longer I have lived, and the nearer I have advanced, step by step, to the grave, the more I am convinced how small is the amount I know; and while I feel the most perfect humiliation that I know so little, I am bound to make the most public acknowledgment of the full extent of my ignorance. In fact, having discovered my error, the only reparation I can make is such an acknowledgment.

I have often been amused, and sometimes surprised, on communicating the change of my views to my acquaintances and friends; several of them have, however, though many have not, become converts to my opinion. If I mention the subject to one man, he shrugs his shoulders, and seems as if something had stuck in his throat. If I speak of it to another, he cocks his eye into one corner, and smiles sarcastically. A third shakes his head, and swears that the doctrine of contagion is true. A fourth strokes his chin, makes a dead stand, and confesses the matter requires farther consideration. If you will stroke your chins, and make a similar declaration at the end of this lecture, with a resolution to consider the investigation, I shall be perfectly satisfied.

I shall now repeat the facts and arguments which I have used for years, and which have found their way into print, without any acknowledgment of, or allusion to the source from which they originated.

There are many reasons for supposing that typhus fever arises not from human contagion, but from malaria, or marsh effluvia; and the six following are, in my mind, perfectly conclusive:—

Typhus fever arises in single cases, at the same time, in places remote from each other.

This is the fact in London; and not only so, but it is the case in the country also, that typhus fever takes place at the same time in single cases, at remote situations, in places, and among persons where, and with whom, there has been no communication or contact, or intercourse of any kind.

Does the doctrine of contagion account for this? Certainly not.

It often attacks several persons at one time, and in one place, where it has not before existed.

This is a very remarkable circumstance. I have the history of fourteen cases of typhus fever in a school, where no such fever previously existed.

It attacked some of the fourteen boys in one day.

Two ladies, sisters, had been in the country, during which time their house in London had been shut up. When they came to town their strength had become impaired, and they were both attacked by typhus fever.

Does the doctrine of contagion account for this? Certainly not.

When several are thus attacked, some cases generally assume the remittent or intermittent character.

Trace the history of all the cases minutely backward, and it will generally be found that the affection in some of them has assumed, in the beginning, the remittent type, between which there is a mere shade of difference, for they have some similar characters; and it is allowed, I believe by all, that they have a common origin.

Does the doctrine of contagion account for this? Certainly not.

The intermittent, remittent, and continued forms of fever, with their peculiar symptoms, pass and re-pass into each other.

The intermittent will become remittent, the remittent will become continued, the continued will become remittent, the remittent will become intermittent.

Does the doctrine of contagion account for this? Certainly not.

Typhus fever prevails most remarkably in particular places.

The common belief is that it prevails only in crowded situations; but this is not true. It may readily be shown to be a perfectly erroneous opinion, for typhus fever exists in some of the most open districts in London. It prevails in one of the best built squares, and in parts and patches of London. With a map of London before me I could point out distinctly where it occurs; where the earth's surface is filthy, and the drains are imperfect. Here it has prevailed, passing under various names; but when the earth's surface has been cleansed, and the drains have been purified, the disease has disappeared. I could point out places where the disease almost always prevails. There is one particular

district which borders on two parishes, where typhus fever has prevailed for the last sixty years, and where it still occurs. It is so marked, that on a map you might circumscribe it with a line. In the borough typhus fever prevails remarkably. Some time ago a family were brought into the Fever Hospital with typhus fever. The account they gave was, that an individual next door had fever, and that they visited him and caught the disease. We cannot, however, always depend upon human testimony. The name of the family was Jay, and they lived in White Square, Clapham. The case of fever next door was one of scarlatina, and had occurred four months previously. On farther investigation of the cases of this family, I found that all but one originated in intermittent and remittent fever. Running around the whole of this square is an open common sewer; and if typhus fever occur in Clapham, it is sure to be in that vicinity.

Typhus fever prevails very remarkably in another village, which is one of the most beautiful in the neighborhood of London.

I know two ladies, who had typhus fever, who were living in a very airy square. The house was built on dry ground; but there were open sewers in the square, which rendered the inhabitants liable to this affection.

I know an old practitioner, upwards of seventy years of age; and in the whole range of his recollection, typhus fever has prevailed in a certain district, and is still prevalent. The earth is unclean, and the drains are bad.

I was once looking at a house, which I had some thoughts of taking; but a medical man warned me against it, as there was always typhus fever there, and on that account a family had just left it. It was in a very airy district, but malaria prevailed. I could mention many other parts where it prevails, but these may suffice.

Is this fact explained upon the doctrine of contagion or can it be explained upon that doctrine? Certainly not.

The rise, progress, and decline of typhus fever, are connected with certain states of the earth and the air.

To give a few examples:—Typhus fever has prevailed remarkably since April, 1824, in and about London, but certain places have been wonderfully exempt from it; for example, Islington,

Wimbledon Common, and the higher parts of Kensington; but it has been exceedingly prevalent in some of the lower parts of the latter; and in all these situations which have been exempt from the disease the soil is dry and gravelly.

In one part of Norfolk there is a district, of which several thousand acres are sometimes covered by a continuous wave, and when the water subsides, leaving the slime exposed to the sun, then continued, remittent, and intermittent fevers occur very remarkably. In the period I have mentioned, since April, 1824, all these parts were under water; and while that was the case not a single instance of typhus fever occurred.

Typhus fever prevails remarkably with certain states of the earth and air.

I attended a very respectable tradesman, laboring under a remarkably bad attack of typhus fever. It was such a case as would have been called plague in the time of Sydenham. He had knotted glands, and carbuncles, and black petechiæ. He was one of four or five individuals who transacted some business in a nobleman's kitchen; he was sickened at the time, and in common with all the other individuals had an attack of typhus fever.

A friend of mine had the drains in his house cleaned, and during the operation the inmates were attacked by typhus fever. He ordered a dirt-hole in his house to be cleared out, and himself and three inmates were attacked by this disease.

Two ladies, sisters, to whom I have already alluded, went into the country; and during their absence, the house, which is situated in one of the squares, was shut up. When they came home, they were both attacked by typhus fever.

There is one house in the borough, where typhus fever has prevailed for a series of years. I have attended three individuals in that house; and I was informed that no family had entered it for some years, part of which had not been attacked by typhus fever in it. A common sewer runs close behind it."

Symptoms.—Typhus fever is preceded by languor, headache, loss of appetite, an uneasiness at the pit of the stomach, giddiness and nausea, a pale, shrunken countenance, dull, heavy eyes, tremor of the hands, weariness, debility, and disinclination to mental or corporeal action. When these symptoms have continued from two to

six days, the system becomes more deranged. Chills, alternating with flushes of heat, occur. There is anorexia, pain in the back, loins, and extremities; nausea, and sometimes vomiting; the pulse is frequent, and mostly feeble, although at times it is full and bounding; the tongue is covered with a white fur, the bowels are constipated, the urine is scanty and high-colored, the countenance dingy and heavy, the eyes watery, with congestion of the conjunctiva, which often extends to the nasal fossa and larynx. There is tinnitis aurium, a confused, heavy sensation in the head, epistaxis, a sense of fulness in the epigastrium, and an increased disinclination to mental and physical exertion.

As this cold or congestive state subsides, the brain, spinal cord and nervous system become irritable, the impression passing through the sympathetic nerves to the heart and arteries; the circulation is aroused, the face is flushed, the heat of the body accumulates, the surface being universally hot, and there is little disposition to perspiration. There is thirst, the pulse is stronger and fuller, the bowels are constipated, the mind more confused; the patient becomes fretful and restless, there is an anxious expression of the countenance, the urine is small in quantity, and of a reddish color. After the second or third day of the reaction, there are frequently catarrhal symptoms, such as injected eyes, soreness of the throat, difficulty in swallowing and breathing. There is tenderness in the right hypochondrium, and lumbago. The surface is now hot, with little disposition to perspiration, producing that peculiar kind of heat known as *calor mordax*, which imparts a stinging sensation to the hand. The pulse is now remarkably frequent, and usually feeble, beating from one hundred to one hundred and sixty in a minute. After the close of the third day of the stage of excitement or re-action, there is generally considerable giddiness and sensorial obtuseness, the cerebral symptoms symptoms are more aggravated, and there is frequent and considerable delirium.

The stage of re-action continues from six hours to as many days, and is followed by paroxysms of chills, fever and prostration. As the disease advances, the pulse becomes more feeble and frequent, the tongue brown, and eventually black, the teeth and prolabia incrusted with dark sordes; there is muttering delirium, or typhomania, a diffi-

culty of hearing and in protruding the tongue; dorsal decubitus and subsultus tendinum; and, in violent cases, ecchymoses, hiccough, and a tympanitic state of the abdomen. During the collapse, the urine is generally copious; and, in some cases, there is a tendency to diarrhœa. The face assumes a livid hue; the eyes have a turbid appearance, and a peculiar characteristic odor exhales from the body. When it terminates fatally, coma, more or less complete, is seldom absent; from which, however, the patient may generally be roused for a few minutes.

Varieties.—Typhus fever may be of an inflammatory or congestive character. The brain, lungs, alimentary mucous membrane, liver, and peritoneum, often become inflamed during the continuance of the fever, constituting the inflammatory variety of typhus. Generally, in these cases, the phlegmasial symptoms do not occur until the second or third day of the stage of excitement. When the brain is inflamed, there is deep and pulsating pain in the head, flushed countenance, throbbing carotids, redness and sensibility of the eyes, irritability of temper, pains in the extremities, irregular respiration, continual wakefulness, early and uninterrupted delirium, a bloodshot appearance of the eyes, contracted pupils, agitated countenance, continued moaning and coma. When the lungs are inflamed, the symptoms of pneumonia are manifested, in which form the sputa is of a rusty appearance from the very commencement. In summer, it is more frequently associated with gastric, intestinal, or hepatic disorders. Inflammation of the fauces is also not unfrequent, and sometimes the disease is complicated with erysipelas, and not unfrequently associated with enteric or typhoid, and remittent or bilious fever. In malignant cases of this kind of putrid fever, there is, from the very commencement, extreme debility, violent pain in the head, oppressed respiration, a small, feeble, and variable pulse, and a confused and anxious countenance. The tongue, though at first pale and slimy, becomes rough, brown, and sometimes nearly black, as the disease progresses. Colliquative hemorrhages and involuntary stools generally occur during the close. Occasionally, coma is among the first symptoms

Diagnosis.—Typhus fever is most frequently confounded with the enteric form, but it may be distinguished by the following diagnostic signs:—It is less insidious in its approach, there is more consti-

pation of the bowels, the sensorial functions are earlier and more invariably disturbed, and the muscular prostration is greater than in enteric fever. Mental depression, a sullen gloom of the countenance, disinclination to mental and corporeal exertion, together with more distinct chills at the commencement, constitute marked indications of typhus. There is also a less tympanitic state of the abdomen, and the average duration is probably only two-thirds of that of typhoid fever.

Anatomical Characters.—Although different evidences of deranged structure may be presented upon post-mortem examinations, yet there is no characteristic or essential lesion indicating the disease. So far, then, as the morbid appearances are indicative, the blood is the seat of the disease, as it invariably is changed, and as all other unnatural conditions are merely accidental.

Prognosis.—In the simple form, it may be regarded as rather favorable, particularly if no complications arise. In the inflammatory and congestive typhus, the danger is greater in proportion to the parts involved, or the severity of the congestion. The favorable prognostics are a moderate diarrhœa, occurring early. The most certain sign, however, is found in the sensorial functions; for if these be slightly disturbed during the collapsed stage, they indicate a less changed state of the blood. The disease is dangerous in pregnancy, and in the puerperal state. On judging of the prognosis, reference should be made as to the nature of the epidemic. Among the unfavorable prognostics are violent delirium, a frequent, small, irregular pulse, a livid color of the rash, with petechiæ, ecchymoses, or hemorrhage, a livid appearance of the fauces, with gangrenous sloughs or ulcers, distortion of the muscles of the face, tenderness of the abdomen, dysentery, colliquative hemorrhage, etc.

Treatment.—In the first stage, as in other forms of malignant fevers, the system should be thoroughly prepared for medication. This can be accomplished by placing the patient in a well-ventilated apartment, administering a free lobelia emetic, washing the body with soap and water, and emptying the bowels with one or two drams of the fluid-extract of leptandria virginica, and an ounce or two of neutralizing mixture. This should be followed by a full round of sulphate of quinia and prussiate of iron, say from ten to

thirty grains of the former, and from forty to sixty of the latter, divided into five or six powders, and administered at an interval of every two or three hours. If there is a hot and pungent surface, aconite or veratrum may be given, either in combination with the antiperiodics, or at intermediate periods, until the fever is controlled. If there is great prostration, a stimulant should be added to the quinia, such as xanthoxylin or capsicum. If this treatment does not interrupt the severity of the disease, the surface should be frequently sponged in tepid water, and the febrifuge repeated sufficiently often to maintain gentle diaphoresis. If there is great prostration, one or two drams of carbonate of ammonia should be added to five or six ounces of water, and a teaspoonful given every half hour or hour. If there is local inflammation, hot packs should be applied, and repeated until the inflammatory excitement is controlled. If there is delirium, with indication of cerebral spinal softening, as indicated by typhomania, dorsal decubitus and subsultus tendinum, two or three grains of cypripedin, in combination with one or two grains of ferri hypophosphite, may be administered every one or two hours. The strength should be supported by iced milk, drank freely, chicken broth and beef tea, and in case of great prostration, milk punch, to which a small amount of capsicum has been added. After waiting for a few days, if the disease has not abated, the antiperiodic may be repeated; and if there are still symptoms of great prostration, five or ten drops of creasote, and ten or fifteen of prussic acid, may be added to six ounces of water, and a teaspoonful taken every two or three hours. The bladder should be frequently examined, and if found distended, evacuated by means of a catheter. The bowels should be kept open with leptandrin, aided by warm water enema. In cases of cerebro-spinal congestion, chafing liniments or sinapisms should be applied to the spine, cold water or ice to the head, and jugs of hot water to the feet. If there is coma, belladonna, in doses of one-sixteenth or one-twentieth of a grain, administered two or three times a day, has frequently been followed by relief.

In some of the more malignant forms, the mineral acids have been used with much success. This is especially the case with nitro-muriatic acid, in four or five drop doses, diluted in water, and administered three or four times a day. Dr. I. G. Jones was in

the habit of giving large doses of brandy in the latter stages of the disease, connected with great prostration. During convalescence, hydrastin and iron, or the tonic tea, drank freely, will frequently prove of benefit. In some of these cases, where other remedies have failed, I have found five or ten grains of capsicum, administered every two or three hours in a wine-glass of cream, to be of great benefit. The thirst can be satiated by allowing the patient to dissolve in his mouth small pieces of ice, and by drinking liberally of the cold infusion of althæ officinalis. Lemonade may also be taken, in most cases, with benefit. If the bowels should be tympanated, five or ten drops of turpentine, administered on a little sugar, three or four times a day, will prove serviceable. Benefit is also derived from bathing the feet. If there should be wakefulness and great nervous excitement, small doses of camphor and opium will frequently procure rest, and effect favorable results. The attendants should avoid awakening and irritating the patient when in a quiet repose, and every thing which tends to disturb the mind should be avoided.

YELLOW FEVER.

Yellow Fever is a disease of hot weather and warm climates. It seldom prevails more than forty degrees north or south of the equator. An average temperature of eighty degrees F., continued for two or three months, has been considered necessary for its appearance, although it has occurred at a lower temperature. It prevails mostly in large towns, situated upon the sea-coast, or other places where a number of human beings are congregated, but seldom appears to any extent in a scattered population. It usually appears in the latter part of summer, and the commencement of autumn, and invariably ceases on the occurrence of frost.

Yellow fever exhibits a great diversity of phenomena. Epidemics of it, occurring in different places, have been marked by very dissimilar characteristics. In some instances it has borne a close analogy in its symptoms to ordinary bilious fever. The effluvium generated among the filth of congregated masses of people, has occasionally given it a typhous form. To give the history, with all the peculiarities and varieties of yellow fever, would be incompatible with the objects of this work. We shall, therefore, only give a general character of the disease. The state of the system may be sthenic or sthenic, inflammatory or typhous.

Symptoms.—The attack is sometimes preceded by the usual preliminary symptoms of fever; but, perhaps, quite as frequently comes on abruptly, in the midst of ordinary health. There is generally some chilliness at the commencement, but seldom, however, amounting to rigors or shivering. Among the most characteristic symptoms of the incipient stage, are severe pains in the back and limbs. There is great restlessness, thirst, a hot and dry skin, hurried respiration, a flushed face; the eyes are red and watery, the tongue is covered with a white fur; soreness of the fauces, difficult deglutition, and occasionally vomiting and nausea, are experienced immediately on the commencement of febrile action; although, however, in the majority of cases, the gastric symptoms are not fully developed for some time, perhaps from twelve to twenty-four hours, when they become very characteristic. The patient complains of a burning pain, or of great oppression, weight and tension in the epigastrium; there is more or less tenderness upon pressure, and the stomach is exceedingly irritable, producing violent and distressing vomiting from the flatulence which is apt to attend. There is great gastric heat, consequently there is an intense desire for cold drinks. The bowels are usually constipated, and sometimes they are very obstinate; and when discharges are obtained, they are very unhealthy and offensive. The patient, however, suffers most from the nervous symptoms manifested in the progress of the disease. There is generally pain in the forehead, eyes, and on one side of the head, of a violent and most distressing character, which is only surpassed by the excruciating pains in the back and limbs, which sometimes continue during the whole period of febrile excitement. At this stage there is more or less mental disturbance, the patient being apprehensive, anxious, and exceedingly restless, which feelings are strongly marked upon the expression of the countenance. There is more or less delirium, sometimes amounting to maniacal violence, with a wild, fiery look and furious movements; but there may be, instead, in cases of congestion, drowsiness, stupor, coma, etc. This stage of febrile re-action continues usually with little abatement for a period varying from a few hours to three or four days; but the duration is shorter in the more violent cases, and longer in the mild. After having run its course the fever subsides, the skin becoming cool and soft, the pulse more natural, the respiration calm, the sto-

mach more quiet; the headache and pains in the back and extremities, if not previously relieved, disappear, and the patient, freed from mental and bodily disturbance, becomes comparatively cheerful and hopeful of recovery. In mild cases, convalescence commences with the subsidence of the fever, but generally the great struggle is to come. In severe and malignant cases, the abatement of the fever indicates inability of the system to keep up even an irritated action of the circulatory system. Upon pressure in the epigastrium, the tenderness is increased. Instead of the redness of the eyes and face, they present a yellowish or orange-colored appearance, which gradually extends over the entire body. The urine has a yellow tinge, the pulse is slower than natural, and in bad cases there is frequently a little heaviness or stupor. This period of remission may continue for a few hours, or be prolonged for a whole day, when another class of phenomena is presented, viz., debility, prostration, or collapse. The pulse becomes quick, feeble, and irregular; the skin yellow, orange, or of a bronzed hue; the circulation languid, particularly in the capillaries; the tongue brown and dryish in the centre, or smooth, chapped, and red; sordes gather around the teeth; the extremities become purple, the stomach is exceedingly irritable, rejecting every thing that is taken, and ejecting a darkish fluid, consisting of brown or blackish flakes diffused in a colorless fluid; the blood recedes from the capillaries; the urine may appear natural, or almost suppressed; blood may ooze from the gums, the fissures in the tongue, the fauces, and the nostrils. It is sometimes also vomited, or passes from the bowels, or with the urine; and occasionally, from its extravasation, petechiæ and vibices appear under the skin in different parts of the body. Gradually the pulse becomes almost imperceptible at the wrist, the respiration is slow, there is frequent sighing and hiccough, the skin is cold and clammy, large quantities of blackish matter are ejected from the stomach, and discharged from the bowels, an offensive odor sometimes exhales over the entire body, the eyes are sunken, there is a low, muttering delirium, the countenance is collapsed, and the patient dies, either quietly or in convulsions. Black vomit, yellowness of the skin, and hemorrhage, are not, however, always attendants in fatal cases, as death may ensue without being indicated by their presence.

Sometimes, however, the patient, instead of passing off so rapidly, may linger in a typhoid state for perhaps two or three weeks, and then sink gradually, or convalescence may commence, which is usually slow and tedious. Thus, we have the general symptoms and course of yellow fever, exhibiting three distinct stages. The first is that of the primary febrile action, continuing generally two days; the second, that of subsidence, lasting one day; and finally, that of collapse, continuing only two days in rapidly fatal cases, or the patient may pass into a slow typhoid state, or convalescence may ensue.

Yellow fever, as has been remarked before, is liable to many diversities. Generally in the first stage, the action is inflammatory or asthenic, and the pulse full, tense and strong. Sometimes, however, the state of the system is asthenic from the beginning, the pulse being very frequent and small during the febrile excitement, or the general strength being inadequate to rally from the effects of the first stage, thus producing symptoms of great exhaustion, especially of the capillaries. Sometimes there is no perceptible febrile reaction, the patient being stricken down with stupor or coma, and death is preceded by convulsions. So again the most prominent symptoms are those of overwhelming precordial oppression, with a slow respiration and deep sighs and groans, or the stomach may be principally affected, producing incessant vomiting, with intense epigastric distress. In some cases, the patient may be walking in the streets, and nothing call attention to his case, except the unusual expression of his countenance. On examining the pulse, it is found very feeble, and almost absent from the wrist. Black vomit and death rapidly follow. Again, the pulse is merely natural, the tongue clean, and the stomach in a good condition from the commencement; but great restlessness, distress and anxiety give rise to alarm, and very soon the black vomit and prostration ensue. While these terrible cases are frequent during an epidemic of yellow fever, there are others in which the disease appears in a very mild form.

It will be observed that the most characteristic symptoms of yellow fever are the rapid, irregular and jerking, or else the slow and feeble pulse, the blood-shot appearance of the eyes, the diffused redness of the upper part of the face, the yellow hue of the skin ap-

pearing on the third or fourth day, and the *black vomit* during the latter stages.

The black vomit, so strikingly present in this disease, appears first in small quantities, the flakes being lighter at first. It increases gradually, and the quantity discharged is frequently enormous. It gushes forth without any effort on the part of the patient, as is the case in ordinary vomiting, and sometimes almost without his consciousness, is ejected upon the bed clothes. Again, it may be discharged in mouthfuls by a sort of regurgitation, and portions of it come frequently with hiccough. When there is an utter loss of power or sensibility in the gastric coats it may exist in the stomach, and very little be discharged. In such cases, a loud gurgling sound can be heard upon every movement of the body, owing to the presence of air and liquid in the stomach.

Formerly, it was thought to be black bile. Recent investigations prove it to be an altered condition of the blood, which modification is effected either in the capillary vessels, or in its exit from them through the epithelium. Though apparently homogenous when ejected, it separates upon standing into an insoluble black flaky matter, like coffee grounds or soot, and a clear viscid liquid, the former being the coagulable part of the blood, and the latter, the serum. Animalculæ and microscopic fungi have also been detected in it, but its principal ingredients have been found to be disintegrated blood, varying from the proper black vomit, to a dark tar-like liquid sometimes mixed with imperfect coagula to pure blood.

Cause.—The peculiar characteristics of this disease, its limitation to certain geographical boundaries, and its appearance in an epidemic form, infer that a special cause is required for its development. What, then, is the nature of the cause? Is it contagious or non-contagious? Volumes have been written in defence of these two opposing views, and for a full consideration of the fever, the student is referred to La Roche's admirable treatise on this subject, in which he clearly states the grounds which confirm that the disease is not contagious. The disease may be considered as one of low, flat and level localities, and belonging more particularly to hot latitudes. It is never shown beyond a certain elevation, as previously remarked. It always manifests itself at the period of the

year when the heat is greatest. Heat alone is, however, insufficient to produce the disease. It often appears during or immediately succeeding rainy seasons, and is usually manifested in damp localities. But innumerable facts prove that humidity, when combined only with heat, is insufficient to produce the disease, but by some local cause capable, when influenced by atmospheric vicissitudes, of generating a specific poison, by which the atmosphere is affected; which, when entered into the system, impairs the vital properties of the blood by the poison which it contains, and produces a morbid impression upon the nervous centres, and in this manner deranging the functions of the body, and producing morbid conditions in the several organs and tissues. The absence of the degree of atmospheric heat is the principal cause of the non-occurrence of yellow fever at a high elevation above the level of the sea. Partly, for the same reason, its geographical limits are restricted within certain bounds in a northern direction, while, in a southern, the same effects are produced by an excess of heat and telluric and meteorological influences. In this respect it differs from other diseases, the contagiousness of which is established. Its rise and progress, in an epidemic form, is not consistent with its diffusion by contagion, it being spread too rapidly to be caused by it. Acclimatization is a preventive of an attack of the fever. Those residing in the yellow fever zone are rarely affected: they become accustomed to the influence of the climate, and are not so liable to an attack. But after a long residence in cold and more salubrious places, they lose their acclimatization, and on their return to their former abode are prone to suffer from the disease. The most susceptible subjects are those who have recently arrived in infected localities, particularly those of northern climates. Sanguine individuals are more prone to the disease, and generally the male sex is the most liable to be affected, and occurs more in advanced life. Owing to their acclimatization, negroes are not so susceptible to yellow fever.

Fear, excessive joy, anger, despondency, disappointment, intense mental application, etc., are powerful predisposing causes, while hope, cheerfulness, courage, and an even disposition, shield the system from the disease. Exposure to cold, loss of sleep, intemperance in respect to food and drink, or a too rigid and abstemious

diet, immoderate evacuations, venereal excesses, or any other indulgences, capable of debilitating the system, may be ranked among the exciting and predisposing causes.

Diagnosis.—In the first stage the symptoms are not distinctive, and it is often very difficult to arrive at a positive diagnosis. There are, however, sometimes symptoms which may point out the nature of the disease; as, the red appearance of the face, and the severe pains in the loins and extremities. The most important diagnostic signs in the latter stages, are the excessive irritability of the stomach, and extreme epigastric tenderness, the slow and irregular, or the feeble and rapid pulse, the yellow hue of the skin, the great prostration following the subsidence of the febrile reaction, and finally the black vomit. Although these are not always present, yet there is generally a sufficient number to render a positive diagnosis. In a doubtful case, reference must also be made to the circumstances under which it occurs.

Anatomical Characters.—The body presents various morbid appearances after death, there being, usually, more or less ecchymosis or subcutaneous effusion of the blood. This blood is much darker and frequently incoagulable, and in various parts of the body extravasation has been observed, especially in the capillaries, and in the parenchyma of the lungs. The membranes of the brain are often inflamed, and serum effused in its ventricles. The lungs sometimes exhibit signs of sanguineousengorgement, and the heart is soft and flabby. The kidneys and bladder sometimes evince traces of inflammation. The chief force of the disease falls upon the liver, stomach and alimentary canal, especially the stomach. The liver is variously affected, sometimes being soft and flabby, or engorged with blood, and, again, it may be dry, anæmic, and of a yellow color, rarely inflamed. In some instances the spleen is congested, though generally it remains unaltered. The stomach frequently contains more or less of the black vomit. Occasionally it contains blood in different stages of alteration. Usually, the muscular and peritoneal coats are sound, but the mucous coat is reddened, and sometimes thickened and softened. The pyloric portion is generally the most affected. The intestines contain black matter, similar to that found in the stomach. Patches of redness, ecchymoses and softening are sometimes found in the

intestines, and also in the œsophagus. In some cases the penis is covered with eschars, and the scrotum is swollen and thickened, and is brown or blackish, as in senile gangrene, and sometimes there are excoriations.

Prognosis.—Yellow fever is a fatal disease, varying greatly in violence at different periods and places of its appearance. Sometimes it is so virulent, that the great majority of cases terminate fatally; in other instances it is mild. When it occurs in the form of an epidemic, the first cases are usually the most severe, and sometimes nearly all end fatally; but afterwards, the disease becomes milder, and towards the close, cases may recover. Unfavorable prognostics are yellowness of the skin, excruciating pains in the forehead, back and limbs, a frequent and feeble pulse, a bloodshot appearance of the eyes, short febrile reaction, slow and difficult respiration, hiccough, restlessness, coldness of the extremities, suppression of the urine, a universal hemorrhagic tendency, coma, delirium, convulsions, and finally black vomit. A favorable prognosis cannot be entertained, with much confidence, in most cases. Black vomit, hemorrhage, uræmic convulsions or coma, are liable to occur unexpectedly in cases which appear to be progressing favorably.

Treatment.—The indications of treatment in yellow fever are, first, to produce reaction; secondly, to interrupt the periodicity, and prevent, as far as possible, the consecutive symptoms; and thirdly, to control the febrile excitement, local congestion and inflammation when it occurs. The reaction may be produced by rubbing the surface freely with the compound tincture of capsicum and myrrh, or capsicum and vinegar, jugs of hot water to the feet, sinapisms to the spine, and when required, to the abdomen. The stomach should be thoroughly evacuated by a lobelia emetic, administered in connection with large draughts of capsicum and ginger tea, after which the bowels should be evacuated by the following:—Take compound syrup rhei et potassa two fluidounces; fluid extract leptandria Virginica, three ounces; compound tincture capsicum and myrrh, half ounce. Mix. Dose one teaspoonful to a tablespoonful every half hour or hour, until it acts freely as a purge. This should be followed by the following antiperiodic, stimulant and nervine:—Take pulverized camphor, two grains; pulverized capsicum, twenty grains; xanthoxylin, ten grains; quinia sulphas, twenty grains;

gelsemin, one grain; sacch. alba, one dram. Mix, and make twenty powders. Dose, one every hour or two until all are taken.

If during the administration of these powders, there should be local congestion or inflammation, hot packs should be applied, and if there is violent reaction, small doses of the tincture of veratrum viride should be administered. If there should be nausea and vomiting, from five to ten drops of creasote should be added to six ounces of water, and a teaspoonful given every fifteen or twenty minutes, until controlled. If there are indications of congestion of the liver, hot packs should be applied over the right hypochondrium, and the antiperiodic powders followed by equal parts of leptandrin and xanthoxylin every two hours. Where there is great prostration with a tendency to decomposition of the blood, hypophosphite of iron, alnuin and strychnin should be given in connection with hot cream punch, beef tea or chicken broth. In cases where there is great prostration and congestion, and the paroxysms are liable to occur at short intervals, much larger doses of quinine and stimulants may be administered. If the disease is complicated with cerebro-spinal congestion, as indicated by low muttering delirium or typhomania, prussic acid, cypripedin, prussiate of iron and carbonate of ammonia are the remedies to control these symptoms. If there is suppression of the urine, from one fourth to one half grain of apocynin, administered every two or three hours, will remove the difficulty.

In the treatment of yellow fever, it must be borne in mind that no remedies or plan will be successful, unless the sedative influence of the malarial poison be so far removed as to admit of a most thorough reaction. The danger in the early stage of this fever is from the overwhelming depression which is caused by the materies morbi producing it; hence, if the first effort to energize the partially paralyzed powers of the body should fail, it should be followed by still more vigorous remedies. Large doses of capsicum, xanthoxylin and camphor may be given, and frequently repeated. It must also be borne in mind that this is a periodical fever, and is liable to all the varieties of exacerbations. These should be carefully watched and promptly met by full doses of antiperiodics, and that these remedies should have their influence, they should be mostly combined with active stimulants. During convalescence the patient

should be nourished with milk, essence of beef, crust, coffee and such other articles of food as the stomach will tolerate. Both during the active stage and convalescence, the room should be most thoroughly ventilated, the body frequently rubbed and sponged in soda water, and the linen changed at least once a day. If there should be hemorrhage from the stomach or bowels of an active character, from five to ten drops of the oil of erigeron should be given, every half hour or hour until it is controlled.

THE PLAGUE.

This disease is regarded as nothing more than a malignant typhus fever, attended, during its course, by buboes and carbuncles. It is ushered in by rigors and oppression, followed by heat of the skin, great prostration of strength, giddiness and head-ache. The expression of the countenance is besotted, and the eyes have a muddy glistening appearance. The intellect is sometimes cloudy, at other times there is insensibility and fixed delirium. Occasionally, stupor takes place, and in some instances the functions of the brain remain distinct and clear. The patient in general seems indifferent respecting his fate. The tongue is at first moist, although it is more or less loaded. There is sometimes constipation, at others diarrhœa. The stools are very offensive, and there is constant nausea and vomiting. About the third day from the attack, there is acute pain, followed by redness and swelling in the arm-pits and groins, which terminate in carbuncles and buboes, unless it is immediately relieved; and if suppuration does not soon take place, death speedily follows. It is stated that if the patient survive the fifth day, and the buboes appear well-formed, the case may be pronounced convalescent. The points of danger in this disease appear to be, the time in which the buboes ought to appear, and the time of maturation.

Treatment.—There can be but little doubt, that from the commencement, this disease requires a vigorous, stimulating, and antiperiodic treatment. From all the information I can obtain, I should make a liberal use of hot alkaline baths, antiperiodics, and a free use of aconite to control the fever. Also a liberal use of tonics, antispasmodics, and stimulants, with a nutritious diet.

SECTION VI.

ERUPTIVE OR EXANTHEMATOUS FEVERS.

On investigating the nature and character of fever, we observe certain characteristics which enable us to distinguish its different varieties. So far we have been considering a class of fevers which have their origin in vegetable or animal malaria, or both combined; which, we suppose, is developed from the decomposition and putrefaction of vegetable and animal matter. We now pass to the consideration of eruptive fevers, which are produced by a specific malaria. It was at one time supposed that all these diseases originated by the introduction of a single specific poison into the blood. More recent investigations have demonstrated that each of these forms of exanthema has its origin in a peculiar malaria, or poison, formed by allotropism, and that this zuma, ferment, or poison, has a specific effect upon the nerves, blood, and skin. The *materies morbi* in the blood is of a peculiar character in each variety of eruptive fever. These primitive molecules are *sui generis*, and are introduced into the system either by absorption or inhalation; hence, they are denominated contagious, as all these diseases are capable, during their progress, of generating a malaria, which, when inhaled by a person unprotected, produces a disease identical with itself. Whether these poisons were generated as the result of putrefaction and decomposition of animal and vegetable matter, or whether they have had a coexistence with the human organism, we are not able to say; but as we do not believe that any substance is formed *de novo*, we apprehend that the malaria peculiar to eruptive fevers, is the product of some of those subtle changes in organic matter, with which we are at present unacquainted. The diseases which we think proper to class under the head of exanthema, are typhoid fever, scarlatina, diphtheritis, measles or rubeola, variola or small-pox, varicella, ery-

sipelas, miliaria, urticaria, roseola, erythema, glanders, dengue, and purpura.

The peculiarities of this class are, that they, when once affecting the system, produce such a change as to render the patient comparatively exempt from a future invasion of the disease. The poison, when introduced into the system under ordinary circumstances, has a definite period of incubation. They are all characterized by fever and its usual constitutional disturbances, together with an exanthem, or an eruption, distinguishing each variety.

TYPHOID FEVER.

Most authors and teachers describe typhoid, or enteric fever, as the common continued fever of this country; and although they have long since discarded the idea that it is one of the modifications of typhus, and the doctrine of Broussais that it originates from intestinal lesion, yet they still persist in claiming it as a peculiar form of enteritis; hence, the most extensive observations have been made upon the nature and character of intestinal lesions connected with the disease, while they have altogether failed in throwing any light upon the real cause of these anatomical lesions. It must be remembered that the change in structure and morbid appearances observed during life and after death, are the result, and not the cause of this fever; as even the observations of Louis have failed to demonstrate that the ulceration in the Peyerian glands, or those of Brunner, in any way contribute to the development of typhoid fever. Murchison is the only writer, with which we are acquainted, who has approximated, in his nomenclature, to a correct idea of the disease. He proposes the name of pythogenic fever, from the fact that it implies a disease produced by putrescent matter. As we carefully analyze the phenomena of typhoid fever, we observe that it manifests great uniformity, development, progress, effects, and termination. The pathognomonic indications, together with its pathological changes, prove that it is a disease produced by the existence of some *materies morbi* in the blood; and the uniformity with which the symptoms occur, together with the local alteration of structure, demonstrate that this poison is of a uniform character, and manifests itself in degrees as modified by various constitutional

influences, and the amount of poison with which the system is impressed.

Symptoms.—When typhoid fever is closely observed, it will be found to pursue a definite course, passing through regular stages, spreading by infection, and being marked by a distinctive rash, presenting all the characteristics of genuine exanthema, to which class it seems correctly and exclusively to belong. For several years I have considered this fever as entirely distinct from the intermittent and remittent varieties, and belonging to the same family as scarlatina, rubeola, &c. I was led to this conclusion by observing, in nearly every case, that the initiatory symptoms, as pain in the head, back, and calves of the legs, wakefulness, &c., subside from the third to the fifth day, and are immediately followed by an extraordinary redness of the surface, which is, in all cases, preceded for several days by a similar congested appearance of the mucous membrane, so far as it is exposed to inspection, as the mouth, rectum, and vagina; and from the embarrassed respiration, anorexia, epigastric tenderness, and irregular condition of the bowels, there is every reason to believe that the entire mucous surface is affected in the same manner. This opinion is farther supported by the fact that nearly all cases of typhoid fever in this country are preceded by more or less catarrhal symptoms, consecutive upon enteric and gastric irritation. The eruption is by no means uniform in its appearance or duration. In some cases careful observation is required to detect it, while in others it appears in large, diffuse patches over the entire body. The appearance of this rash depends much upon conditions; such as the severity of the attack, the power of the system to repel the eruption from the mucous surface to the skin, the physical condition of the patient at the time of the attack, the character of the medication, &c. It also varies much in appearance at different stages of the disease, in the early stage being very pale, and scarcely perceptible; but as the disease advances, and the premonitory symptoms disappear, it presents a vascular, erythematic character.

As the rash appears upon the surface, the mucous membrane presents more of its normal condition; but whenever it recedes the mucous membrane again becomes red and congested, and all the constitutional symptoms aggravated. There is increased pain

in the head and back, difficult respiration and constant gastric disturbance, which again subside on the re-appearance of the rash upon the surface. This rash very much resembles that of the scarlatina, except that it is less florid; yet, in several epidemics, I have seen the appearance so nearly allied, as to lose its identity until the disease had reached the seventh or eighth day of its duration.

At first the eruption is pustular; that is, there are small papillary elevations, resembling very much the papillæ of the tongue, when they become elevated upon a red and congested base in the more advanced stages of the disease. The papillæ upon the surface of the body, however, are pale, or of a darkish-purple hue. The rash usually makes its appearance from the third to the fifth day, first upon the bowels, back, and neck. In more favorable cases, in the course of thirty-six hours from the first appearance of the erythema, its papillary character becomes plainly visible. In twenty-four or thirty-six hours after it is first seen, a small white vesicle appears immediately upon the apexes of the papillæ, which writers term sudamina. These vesicles, being very small and transparent, are frequently mistaken for dry dermoid scales, which, to the casual observer, they very much resemble. They are filled with a thin watery fluid, which very readily escapes on the vesicle being ruptured. If the powers of the system be feeble, and the fever be of an adynamic character, the vesicles remain small, and in the course of twenty or thirty hours after their occurrence they lose their transparency, and present a faded and dingy appearance, and in some cases entirely disappear. In this event, not only the sudamina disappear, but the entire erythematic eruption recedes to the mucous surface. I am satisfied that the petechiæ are an enlargement of the glands of the skin, caused by the irritation of a specific poison, and that the sudamina are the result of an exudation of particles of lymph or albumen from the cutaneous capillaries. This eruption, manifesting itself as it does in the *rete vasculosum* of the chorion, always destroys more or less of the scarf skin. Previously to the appearance of the exanthema, the capillaries of the cuticle may be observed to be heavily loaded with blood, which circulates with remarkable sluggishness until the eruption makes its appearance, when it circulates with more freedom, the skin becoming hot and dry. Whenever the deeper capillaries of the chorion become

weakened, either from imperfect nutrition, or from lack of nervous influence, the rete becomes injected, giving rise to petechiæ. Another point of interest in the exanthema is, that in all cases the petechiæ may be seen before the bleb or sudamina. But this requires careful observation, as in the early stages of the disease the rete has not a red or florid appearance, although it may be slightly œdematous.

Another important feature of typhoid fever is the tendency to metastasis, or recession of the eruption from the surface to the mucous membrane of the bowels, lungs, &c. The transfer of diseases from one organ or tissue to another, is of common occurrence, especially in exanthema. In scarlatina, rubeola, and typhoid fever, the recession of the erythema from the surface is always accompanied by serious constitutional disturbances, such as pain in the head and back, with greater epigastric and precordial pressure, high-colored urine, anorexia, and, in many cases, nausea and vomiting. There is also a strong tendency to disorganization of the mucous membrane, which is always preceded by a loaded or congested condition of the mucous capillaries. The weakened respiration and the albuminous urine, are among its first indications. As soon as the erythema disappears, if its disappearance be premature, the respiration becomes quick, and the atmospheric air fails to penetrate the minute bronchia; hence, the blood is imperfectly supplied with oxygen, and the effete and waste tissues fail to be converted into products for elimination. If this condition continue, the blood loses its coagulating power, as it is in all cases maintained by healthy respiration. It also loses its bright scarlet appearance in the arteries, and assumes a dark-purplish hue, indicating that it is overloaded with particles of waste matter from the body. If this condition of the mucous surface of the body continue for any considerable length of time, the blood is unfit for circulation in the minute capillaries, and the phenomena of life gradually fade, until the patient expires. Or if by a well-directed course of medication, or by natural active forces of the body, the erythema again appears upon the surface, respiration becomes natural, the inspired air penetrates the minute bronchia, giving off its oxygen to the blood, and the zymotic products are converted into carbonic acid, urea, perspiration, &c., and are eliminated from the system by its various

emunctories. I am unable to state the precise time of the appearance and duration of the eruption in typhoid fever. In many cases of a mild form I have noticed the rash to appear on or about the fifth day, to desiccate on the seventh, and desquamate on the tenth. In other cases I have observed the rash in the very outset, and again it did not appear until the disease had progressed for twenty, or even thirty days. In this event, however, the mucous membrane becomes seriously disorganized, and in most cases there is severe hemorrhage.

Dr. Bartlett remarks, that the most usual period for the appearance of the eruption, is during the second week of the fever. In a few rare instances, they are seen as early as the close of the first week. Of twenty-five cases in which this point was successfully noticed by Chomel, the eruption appeared between the sixth and eighth days of the disease, in two; between the eighth and fifteenth days, in thirteen; between the fifteenth and twentieth days, in seven; between the twentieth and thirtieth days, in four; and on the thirty-seventh day, in one. They generally come out successively, one after another, and after remaining, commonly, for little more than a week, they successively and gradually fade away and disappear.

To detect the eruption, the finger must be passed very delicately over the surface, as they have none of the hardness of the papulæ of lichen, or of the first day's eruption of small-pox. Their apices are never acuminated, never flat, but invariably rounded; their bases gradually pass into the level of the surrounding cuticle. No trace of a vesicle, or white spot of any kind, is ever detected on them. They are circular, and of a bright rose color, the latter fading insensibly into the natural hue of the skin around. They never possess a well-defined margin. They disappear completely on pressure, resuming their characteristic appearances as soon as the pressure is removed; and this is true from first to last, from their first eruption to their last trace. They leave no stain of the cuticle behind; they never pass into any thing resembling petechiæ; the characters they present, on their first appearance, continue till they vanish. Their ordinary size is about a line in diameter; but, occasionally, they are not more than half a line, and sometimes a line and a half in diameter. The duration of each papulæ is three or

four days; fresh ones make their appearance every day or two. Sometimes only one or two are present at first, running the course above described, and then one or more fresh ones make their appearance, vanish in three or four days, and are followed by others, lasting as long. The number of papulæ seen at one time on the surface, is ordinarily from six to twenty; though occasionally there is only one, and sometimes more than a hundred.

They usually occupy the abdomen, thorax and back, but are occasionally present on the extremities. A *very pale and delicate* scarlet tint of the skin sometimes precedes the eruption of the papulæ, but never lasts more than a day or two; the skin resembling, in tint, that of a person shortly after leaving a hot bath.

Another common eruption consists in transparent vesicles, to which the name *sudamina* has been given. These vesicles are circular, or oval in their shape, varying in size from a small pin's head to that of a split pea, formed by the presence of a limpid fluid elevating the cuticle. Their most frequent seat is upon the sides of the neck, and about the shoulders and axillæ, though they are sometimes scattered more extensively over the body. Chomel says that he has never seen them on the face. They are most readily seen when looked at in an oblique direction. They appear late in the disease, being rarely seen before the twelfth day, usually remaining for several days, and gradually disappearing. They were present in two-thirds of Louis' cases, where they were carefully sought for, and in the same proportion, whatever was the severity of the fever. Dr. Hale attaches much less importance to sudamina, as a diagnostic sign of typhoid fever, than Louis and Chomel.

The rash, then, may appear at different intervals, or not at all; and I have seen it, in more than one instance, disappear after having been out for a few hours only. What is true in regard to the appearance and disappearance of the rash in typhoid fever, is equally so in other exanthematous diseases. Dr. Rogers states that the eruption in measles will sometimes appear on the second or third day, or even sooner; while, in other cases, not until the seventh or eighth.

The disappearance of the rash in measles, on the third or fourth day, caused by exposure to a cold current of air, or by improper treatment, is by no means an uncommon occurrence. In scarla-

tina, it is not unusual for the efflorescence to appear and disappear. In malarial districts nothing is more common than to have this appearance and disappearance of rash assume a regular periodical character. With the absence of rash in scarlet fever, every physician is familiar. In the anginose form, it frequently does not make its appearance until the tenth or twelfth day. In the malignant form, the eruption is always much protracted in appearance, and in many cases entirely absent. The erythema being confined to the mucous surface, as in typhoid fever, the same disastrous consequences are produced. In order to still further support the preceding facts, let us inquire if the disease be contagious.

In 1851, typhoid fever attacked one of the inmates of a large building, located in a healthy village in Western Ohio. The building was occupied by several families, and every individual member had an attack of the disease. A few cases occurred in the immediate vicinity, otherwise the inhabitants of the village were entirely exempt. There was but little communication between the inmates of this tenement and the citizens of the town. In 1855, the disease appeared in a family in another town, and a large number were exposed. The fever spread until a general epidemic was the result. In many cases the disease only manifested itself in the mildest form; but in all the characteristic rash made its appearance. At the same time the disease spread through the surrounding country, but in all cases the patient had been exposed, or lived in a contagious atmosphere.

Another fact that helped to establish in my mind the contagious character of the disease was, that during the first three weeks of the epidemic, the wind blew from the northwest, and the disease spread only in the opposite direction, unless the patient had been directly exposed to the infection. On the commencement of the fourth week the wind suddenly changed to the south, and continued to blow from that direction for some days. In less than two weeks the disease made its appearance in the opposite direction, and spread into the adjoining county. In 1858, this fever made its appearance in another town in Ohio. The first case was in the northeast part of the town, much elevated above the main village. The wind blew from the proper direction to carry the infectious atmosphere over the town, and the result was that the disease spread

most rapidly, and a general epidemic prevailed. Instances might be multiplied to show with what uniformity the disease always spreads to the leeward. Not only is the infectious character of typhoid fever proved by these results, but the almost certainty of its attack upon nurses and attendants, unless they enjoy an immunity from it by a previous attack. I have conversed upon this point with many intelligent physicians of extensive observation, all of whom agree with me, that typhoid fever uniformly attacks nearly all, if not all, of the unprotected members of the family where it makes its appearance. I will relate one instance only, as it occurred in my practice, in illustration of this fact. In 1857, a boy of some ten years of age was attacked by typhoid fever. Before he recovered, his sister, a few years older, came down; and, in two weeks, the father, mother, and two other members of the family, all with the same disease.

Four families in the immediate neighborhood were soon attacked in the same manner, and in the course of two months, it manifested itself, to a greater or less extent, on all persons who had been engaged as nurses or attendants, not exempted from it by a previous attack. I could quote hundreds of similar cases, which I have observed for the last few years. I find my observations verified in other sections of the country, in nearly every particular; so that I have become satisfied that typhoid fever, in this respect, manifests all the characteristics of genuine contagious disease. Although a second attack of this disease is unusual, yet I have seen all the characteristic symptoms the second time, and in one instance an individual had an attack at four different periods. But immunity from a second attack is quite as sure as from any other form of exanthema.

Dr. Bartlett states that "the general opinion has been that typhoid fever was not propagated by contagion." Louis, in his first edition, published in 1829, says nothing upon this subject. Chomel, in his *Leçons de Clinique Medicale*, published in 1834, although he himself was inclined to the opposite opinion, says that not more than one physician in a hundred, in France, regarded the disease as contagious. Andral says he never saw any evidence of its contagiousness. Dr. James Jackson says, if he were to answer from general experience, he should say that instances occur in

which there is much in favor of the doctrine of contagion; but that, in the very great majority of instances, there is not any such evidence. He relates some cases, occurring among the hospital nurses, apparently attributable to contagion. In 1829, M. Bretonneau read to the Royal Academy of Medicine a paper, intending to show that the disease, as it prevailed in the country, was often transmitted from one individual to another. Leuret, about the same time, adopted a similar opinion. The subsequent researches of Gendrof, Ruef, Putegnat, and others, have confirmed this opinion; and Louis has adopted it in the second edition of his work, published in 1841. Many years, however, previously to these publications, Nathan Smith asserted, in the most positive and unqualified terms, the contagious character of this disease. His essay was published in 1824. "That the typhoid fever is contagious," he says, "is a fact so evident to those who have seen much of the disease, and who have paid attention to the subject, that I should have spared myself the trouble of saying any thing in regard to it, did I not know that there are some physicians in this country who still dispute the point; one which I think can be as fully demonstrated as that the measles, small-pox, and other diseases, universally allowed to be contagious, are so." Dr. Smith then mentions several instances, which had fallen under his own observation, where the disease seemed to have been communicated through the medium of a contagious principle. From among these, I select the following:—"A young man, a pupil of mine, was attacked with typhoid fever, from which he recovered with some difficulty. Some of his family, who lived about forty miles distant, came and took care of him during his sickness. Upon his recovery they returned home in good health, but soon after sickened with the same disease, and communicated it to others, who had not been exposed in the first instance. From this it spread to numerous other families in the vicinity, who had been exposed to the contagion. In the whole town where this occurred, there had been no case of typhoid fever for many years, till brought there by the circumstance above related."

During the prevalence of the typhoid fever in Thetford, Vt., a woman went there from Chelsea, about ten miles distant, to visit and administer to a sister sick of this disease. Upon her return,

she was herself attacked by it, and soon after died. Others of her family contracted it of her; and in about four weeks there were thirty persons taken down with typhoid, all of whom had been exposed to the contagion. Dr. Samuel Jackson, formerly of Northumberland, relates several striking instances similar to those quoted from Nathan Smith, showing the contagious quality of the disease. The memoir of M. Gendrin, upon this subject, is very full and elaborate. He adduces a great number of instances, similar to those above quoted from Dr. Smith, many of them very striking and conclusive, to show the contagiousness of the disease. He believes that it is transmissible by direct and repeated contact; by the presence of the sick without contact; that it may be carried from a sick person, and communicated to another by a third, who does not have the disease; and also, that it may be contracted from exposure to infected clothing, beds, and similar fomites. He regards the first mentioned mode of transmission as altogether the most common. The indirect transmission of the disease from one individual to another, through the intervention of a third, he thinks does not often happen, except where it is prevailing more or less extensively as an epidemic. The disease is most frequently communicated to those who are in the closest and most constant relation to the sick, their nurses and immediate attendants.

Genovese states, that during the universal prevalence of measles, in 1787, he attended forty-six cases of both children and adults, who had already gone through with the disease some time before. Dubosque had occasion to treat several children for measles that he had previously carried through the same disease. Dr. Baillie states that he had occasion to treat five children for measles the second time. Every practitioner, of any considerable experience in scarlatina and small-pox, is familiar with instances of their second occurrence in the same individual. Dr. Morton states that he met with a case where the system derived no protection from repeated attacks.

Symptoms.—Few diseases are so remarkably insidious, in their approach, as this fever; its commencement being almost imperceptible. Its incubation generally lasts from three or four days to as many weeks. The patient feels at first, slight debility, with a dull and heavy

feeling in the head, which continues to increase, terminating in violent frontal headache. By the time the disease becomes fully developed, the limbs are weak, with lameness, and in some cases, rheumatic pains. The bowels are at first slightly constipated; but in the course of a few days, there is a strong tendency to diarrhœa. The pulse is accelerated, and a creeping chilly sensation is felt, commencing in the back, and passing over the entire body. The chilliness is soon followed by a slight increase of all the symptoms, together with a dry and warm state of the skin. These partial paroxysms, frequently follow each other in rapid succession; but sometimes there is an interval of several hours. The tongue is but slightly coated, and the appetite remains nearly natural until the disease becomes fully developed. Indeed, in a large number of cases which have come under my observation, there is no anorexia during the entire progress of well-marked forms of this disease.

About this time, there may be observed a number of small white vesicles or sudaminæ, at first mostly confined to the abdomen, but afterwards extending over the entire body. These sudaminæ, although frequently appearing in other fevers, are more generally present in this. These vesicles, unless carefully observed, will escape notice, as they are frequently so small as to be scarcely perceptible to the naked eye, being seldom larger than half the head of a pin; and when pricked with the point of a needle, a small quantity of a thin white fluid may be seen to escape. On the fifth day from the appearance of the sudaminæ, another eruption appears which is diagnostic of this disease. It is small, red, or purple spots or eruption, resembling flea-bites.

At first they are very small, so small that without the aid of some magnifying power, the larger portion of them cannot be seen. They are at first perceptible just above the ileo-cæcal valve, or about one and one-half inches above the crest of the ileum, and extend over all parts of the body; but are mostly confined to small patches of skin, corresponding to the ulcerated parts of the bowels. These spots are called *petechiæ*. They are small circumscribed *red spots* when fully developed. They may be distinguished from most other forms of eruption, by disappearing on pressure, but returning again the moment the pressure is removed. They come and go, appearing and disappearing; but their presence or absence during the

active stage of the disease, is a sure index to the state of the bowels; as when the bowel symptoms are aggravated, the petechiæ disappear; but when they become ameliorated, they are again visible. Thus, Typhoid Fever, like Scarlatina, is an eruptive disease, and to maintain the eruption on the surface, is a very important indication to be fulfilled in its treatment. When the disease becomes fully developed, and in some cases, in the forming stage, the bowels yield a marked tympanitic resonance on percussion. On inspection, a bloated or tympanitic condition of the bowels may be observed, and most marked beneath the patches of petechiæ.

About this stage of the disease, the nervous symptoms become aggravated, amounting in many cases to delirium, and in others producing great pain in different parts of the body, as the knees, hips, abdomen, side and head. These pains are mostly transitory, or appear in the form of paroxysms. In a few cases the patient inclines to stupor, but generally the opposite is the case, being restless and wakeful. There is a buzzing noise in the head, very much like that caused by full doses of quinine.

The tongue, by this time, mostly assumes a red appearance, especially upon the tip and edges, and the papillæ become elevated. In some cases it is protruded with much difficulty, and may be seen to tremble. The pulse increases in frequency, but diminishes in fulness; and in the latter part of the disease it becomes very compressible. The eyes have a watery appearance, and when the bowels become extensively ulcerated, they have a vacant stare and remain partly open during sleep.

The breathing is laborious, the mouth is half open, and sordes accumulate upon the teeth. The urine, which was somewhat scanty, now becomes nearly suppressed, having a dark red appearance, generally containing a large per cent. of albumen. The bowels continue to bloat, the evacuations are frequent, sometimes watery and frothy, at other times dark and offensive, and mixed with blood; or, the entire discharge may consist of blood amounting to active hemorrhage; being mostly of a dark venous character, although I have seen it of a bright red color, or of the appearance of fresh arterial blood. This symptom, although alarming and dangerous if persistent, is frequently followed by speedy recovery. The skin is not as dry and hot as in many fevers, yet it is frequently pun-

gent, and has a husky feeling. The pulmonary organs generally sympathize with affections of the bowels, and especially is it the case in this disease. Hence we find the crepitant rhonchus, and frequently a slight cough. If the disease is about to terminate fatally, the symptoms will continue to increase in severity, the patient will become stupid with low muttering delirium, subsultus tendinum, picking at the bed-clothes, and coma, succeeded by death. Or the ulceration of the bowels may terminate in perforation, followed by a discharge of the contents into the cavity of the abdomen, producing at first much pain, but soon subsiding, the patient becomes covered with a cold clammy sweat, the pulse ceases at the wrist, the bowels evacuate involuntarily, and he soon sinks into the arms of death.

Or what is more frequently the case, where mischievous medication has been avoided, the symptoms will continue in a somewhat modified form from fourteen to twenty-one days, when they gradually become ameliorated, and the patient recovers. The average mortality of this disease is only about ten per cent.

Anatomical Characters.—There is scarcely a single organ of the body that does not present some inflammatory traces; but there are certain morbid appearances which are entirely characteristic of enteric fever, and which are so seldom absent, that they may almost be considered essential. Such is the case in the affection of the Peyerian glands. In the first place, they become enlarged and more perceptible, and present a greyish, transparent surface, dotted over with black points. Then, as the inflammation advances, the patch becomes reddish, and the follicles burst, ulcerate or slough away, or they may disappear without there being much redness or thickening; and sometimes the patch puffs into a sort of fungous swelling, in which all trace of the follicular structure is lost. The color of the ulcerated surface is pale and grey, or it may be red, but more often yellow, as if the exposed cellular and other tissues were stained by the ochrey fluid, which had been poured from the bowels during life.

The solitary glands of the ileum are usually affected in the same manner as those of Peyer, being enlarged so as to be distinctly visible, hard or soft, ulcerated, etc.; this condition is most marked near the cæcal valve. The mesenteric glandsare also frequent-

ly inflamed, owing to the inflammation and ulceration of the mucous follicles. The lesions, above described, are those characteristic of the disease. Other morbid appearances are sometimes presented, such as inflammation, or enlargement of the mesenteric glands, or the spleen, a slight softening of the kidneys and liver, ulceration of the pharynx, esophagus, distention of the colon, etc., all of which may be regarded as the effect, and not the cause of the disease.

Diagnosis.—The diagnosis of typhoid or enteric fever, is generally attended with little difficulty. If we notice carefully the slow and insiduous mode of attack, the dull or heavy expression of the countenance, the dusky hue of the face, the great debility, the tendency to epistaxis, the small and frequent pulse, the character of the diarrhœa, the tympanitic abdomen, the slight rose-colored eruption, the sudamina, the headache, the absence of marked remissions, the obtuseness of hearing, the dry, brown tongue, the diminution of the secretions, we need not be mistaken in our diagnosis. The duration of the disease, generally exceeding that of other fevers, and is an important diagnostic character.

Prognosis. The prognosis is generally not unfavorable, if there be proper treatment in due season. Although it cannot be suddenly interrupted in its course, yet it may often be very materially shortened and conducted to a favorable termination. No case should be looked upon as hopeless, as there are no symptoms so characteristic as to render death inevitable. The most unfavorable prognostic is when the disease is connected with intestinal perforation; yet even then, the effused contents of the bowels may be confined by extravasated fibrin, and the intestinal opening closed; or a curable abscess may take the place of diffused and fatal peritonitis. Other unfavorable prognostics are steady and complete delirium, profound coma, stertorous respiration, rigidity of the limbs and eyelids, hemorrhage from the bowels, excessive diarrhœa, great debility, involuntary discharges, a feeble and frequent pulse, a cold and clammy skin, colliquative sweats and great abdominal distention. The favorable symptoms are diminished frequency of the pulse, and heat of skin, a restoration of healthy secretions, a clean and moist tongue, and consciousness and interest in surrounding objects. The prognosis is more favorable in the young, and in proportion to the previous state of health of the patient.

Treatment.—There is more mischief done in this disease, by an improper course of treatment, than in any other. The practice of giving active purgative medicine in the commencement of a fever, with the notion of puking and purging it from the system, has increased the mortality to an alarming extent. After a drastic purgative has been given, it is almost impossible to cure typhoid fever, no matter how prudent the course may be. First, in the treatment of this disease, the skin should be thoroughly bathed in warm lye-water and whiskey. The patient should then be placed in bed; then, if the bowels are costive, they should be moved by warm water injections. If the stomach contain indigestible food, or if there should be a marked indication for an emetic, one-eighth of a grain of lobelin may be given, in a wine-glass of warm ginger tea, every ten or fifteen minutes, until the stomach is thoroughly evacuated. After this, the patient should drink freely of rice gruel. When the stomach becomes settled, or the effect of the emetic has passed off, give from one to five drops of the tincture of aconite, in a tablespoonful of water, every half hour, until the pulse becomes less frequent and the skin moist. At the same time, warm lye poultices should be applied to the bowels, made by adding one teaspoonful of mustard-seed, to ten tablespoonfuls of slippery-elm, wet with strong salàratus water. These poultices should be changed as often as three or four times a day, and continued as long as the bowel symptoms prove troublesome. When the pulse becomes controlled by the aconite, the next thing is to interrupt the periodicity of the disease, by giving the following antiperiodic:—Take quinia sulphas, ten grains; ferri hypophospite, twenty grains; hydrastin, five grains. Mix, divide into six powders, and give one every three hours until all are taken.

At the same time, give freely of mucilage, such as a cold infusion of pulverized marshmallow, acacia, or flax-seed. Also apply water to the head. If the patient be of a bilious temperament, and full habit, the water should be cold; if nervous with low vitality, it should be tepid, and mixed with a little whiskey. The feet should be kept warm, and the patient remain quiet in bed. At the same time give a sufficient quantity of aconite to control the fever, and to maintain the petechiæ upon the surface. If there should be diarrhœa, small doses of equal parts of erigeron

and rhusin should be given two or three times a day. If the patient be restless and unable to sleep, from the sixteenth to an eighth of a grain of morphine, may be mixed with one or two grains of cypripedin, and given at bed-time. If the diarrhœa prove persistent, in addition to the rhusin and erigeron, injections should be given two or three times a day, composed of from four to six ounces of starch-water, half a grain of morphine, and from five to ten grains of tannin. If the aconite fail to maintain the petechiæ upon the surface, one-half grain of macrotin should be given in connection with it. If after pursuing the above treatment for six or seven days, the disease should not be arrested, the antiperiodic should be repeated. At the same time, the aconite and anti-diarrhœa medicines should be given, if indicated. If the bowels should become persistently tympanitic, with extensive ulceration, the tincture of bryonia should be substituted for the aconite, and the patient prohibited from assuming the upright posture, as in all such cases there is great danger of perforation. Where there is much debility, a permanent tonic may be given in connection with chalybeates, such as the following compound:—Take iron per hydrogen, twenty grains; hydrastin, twenty grains; white sugar, thirty grains. Triturate and mix, divide into ten powders, and give one every two or three hours, during the interval between the antiperiodic medicine. During the entire course the patient's strength should be maintained by means of porter, or Scotch ale; toast and broiled beef may be allowed when the stomach will tolerate them. If the medicine already prescribed fail to maintain the petechiæ upon the surface, the tincture of scrophularia may be given to the amount of twelve drops three or four times a day. If necessary to restore the eruption, hot brandy toddy may be given in connection with the above. If symptoms of softening of the brain appear, from one to five drops of tincture of phosphorus may be given two or three times a day, in a large quantity of mucilage. If dangerous hemorrhage from the bowels occur, take nitrate of silver, one grain; pulverized acacia, thirty grains. Pulverize, mix, make sixteen pills, and give one every hour until all are taken, or until the hemorrhage is controlled; or give from ten to fifteen grains of matico every three or four hours. If an hepatic medicine be indicated, small doses of leptandrin may be given three or four times a day. Where the dis-

ease is firmly established, much care must be observed relative to the administration of medicine, never giving any, unless some marked indication demands it; frequently all that is necessary, are a few drops of aconite two or three times a day, with a liberal quantity of mucilaginous drinks, one or two courses of antiperiodics, and a liberal supply of food; yet, where there is a decided indication for treatment, it should be met with promptness. During convalescence, small doses of hydrastin, in connection with chalybeates, should be administered. Carbonate of ammonia, in the proportion of one dram to six ounces of water, and one teaspoonful given every half hour or hour, is also a valuable prescription as a mild stimulating antacid in the latter stage of this disease.

SCARLATINA.

The first well-authenticated account of scarlatina, is that given by Ludovicus Mareotus and Michael Herodia, who gave a description of it, as it existed in Spain, in 1610 and 1612. Sydenham first described it as it existed in London in 1670, and Sir Robert Sibbald as it occurred in Scotland in 1680. Scarlatina, taken in its widest sense, is a fever of an inflammatory or typhoid character, the offspring of a morbid poison gaining access to the body by the mode of infection only, distinguished by a short period of incubation, an eruption rapidly developed, and an inflammation of the fauces, having a strong tendency to terminate by sloughing. In its mild form, the disease does not exist more than a week; but when assuming its aggravated type, may be protracted to a month, or terminate fatally in a few hours. Such a disease does not, like measles, invade a large proportion of mankind during infancy; but having been undergone, the susceptibility to future attacks is exhausted. A *zuma*, *ferment*, or *poison*, must have access to the body and be set in motion by the blood, so as to develop the phenomenon now called *scarlet fever*. The effects produced by that poison may be exerted on the skin alone, and then the accompanying fever is slight; or it may develop a more serious kind, involving the mucous membrane. It may so seriously affect the whole system as to produce intense fever, in which case the throat receives nearly the *whole* shock, the skin be-

ing alone partially affected. In some extreme cases, the nervous system is so completely compressed and subdued by the virulence of the miasm, and the mass of blood so thoroughly poisoned and disorganized by it, that all the ordinary appearances of scarlatina are masked. Petechiæ, coma, and a sloughy state of the throat, alone appear. Life rapidly yields under such an attack.

The poison of scarlatina, whatever aspect it subsequently assumes, has a very short period of incubation, varying from four to eight days.

In the mildest form, it often happens that the first symptom is the rash. No febrile disturbance whatever has preceded. More commonly, there is a certain amount of fever, the symptoms not presenting any marked character. Rigors, heat of surface, vomiting, restlessness, thirst, languor, lassitude, muscular debility, and headache, are the chief complaints. On the succeeding day the rash appears.

Symptoms.—The varieties of scarlatina are scarlatina mitis, scarlatina anginosa, and angina maligna.

The efflorescence in scarlatina mitis is first perceived on the trunk, arms, and thighs; very often nothing appears on the face, when others are covered with eruption. In less than twenty-four hours it spreads over the whole body. Sometimes the redness is continuous, but much more generally it is distributed in patches of no definite shape. The color is a bright scarlet, precisely that of the boiled lobster. When closely examined, it is found to consist of innumerable small red points, or dots. In the greater number of cases, the finger passed over the surface is not made sensible of elevation or roughness. Sometimes, especially on the breast, and parts kept very warm, the feeling of papulæ is given. This, however, can only occur where there is fever, and sufficient force in the heart's action to distend the cutaneous capillaries. In the mild form of scarlatina I am now describing, this will not often happen. The redness of scarlatina, like that of erysipelas, disappears on pressure. This form is preceded by coldness and shivering, to which succeed febrile heat, thirst, and an accelerated pulse. The child is restless, and refuses his food. About the fourth day the eruption recedes, and finally disappears, and the cuticle falls off in brawny scales.

The scarlatina anginosa is the *primitive* type of the disease, or that from which all the other varieties diverge. It is the most frequent form in which the miasm develops itself. Scarlatina anginosa is a disease which, more than any other that I know of, will call into play your pathological learning, and all your therapeutical skill, and which may be materially aided by medical art. This variety is marked by previous lassitude, dejection of mind, pain in the head, soreness, pain in the muscles of the neck and shoulders, shivering and fever. To these succeed an irritable state of the stomach and bowels, vomiting, diarrhœa, precordial oppression, great dejection of spirits, small and fluttering pulse, a red, hot and dry skin, the tongue is dry and florid along the edges, there is great thirst, the voice is hoarse, deglutition is difficult, the respiration is attended with a sense of constriction in the throat, there is dorsal decubitis, and the ash-colored sloughs which early appear on the tonsils, and, in some cases, delirium, of a fierce and unrestrainable character.

Angina maligna is, unquestionably, produced by a concentration of the scarlatina poison upon the fauces and glands of the throat; and if it be allowed to remain in that position, will result in extensive disarrangement of its structure, and the formation of abscesses, or in extensive œdema. Either condition will most essentially interfere with the functions of respiration, and produce symptoms corresponding with the extent of the organic lesion, and imperfect arterialization of the blood. In what is denominated scarlatina maligna, there is an absence of the angina, which is so prominent a symptom in the anginose form of the disease; and we have every reason to infer that it is produced by an accumulation of the zymotic poison in the blood, which, failing to be eliminated, either through the skin or emunctories, produces a disorganizing influence upon that vital fluid, and, in many cases, immediate and disastrous results. In this form of the affection, the symptoms are more obscure than in either of the two previous ones. There is great prostration, the surface has a dark, livid appearance, there is nausea and vomiting, a quick and feeble pulse, and laborious breathing. There are also ulcerations on the tonsils and adjoining parts, covered with dark sloughs, and surrounded by a livid base. The efflorescence appears about the third day, assuming a dark purple ap-

pearance, but without relief. Delirium, a debilitating diarrhœa, and hemorrhage ensue, and death soon closes the scene, without there is proper and judicious treatment. As in scarlatina simplex, or angina maligna, the diagnosis cannot be very difficult; as in the simple form of the diseases the albuminous urine and lobster appearance of the skin are most conclusive evidences of its nature, while the anginose form is as easily identified by the peculiar affection of the throat, and the allied symptoms are evidences of its nature.

The sequel of scarlatina is dropsy, convulsions, ulceration of the glands of the throat, neck, and kidneys, and disarrangement of the blood. The dropsy may depend upon softening of the mucous membrane, or portions of the kidneys; or upon local inflammation of the peritoneum, pleura, &c., &c. Convulsions occur as the result of irritating effects of the specific scarlatina poison on the cerebro-spinal nerves, and as the effect of the disorganizing tendency of the poison on the blood and other fluids of the body.

Anatomical Characters.—Occasionally, every trace of the eruption disappears after death, but frequently purplish or livid spots remain. Upon cutting into the skin, the cuticle is found reddened and injected. The redness frequently disappears from the fauces, although it is generally found after death. The alimentary mucous membrane occasionally exhibits inflammatory signs, and the kidneys are sometimes congested. The blood exhibits more or less changed conditions; in some cases thick, in others watery, in some dark, in others red, or it may be coagulated.

Prognosis.—There is no disease in which the result is more uncertain than this. The mildest cases sometimes assume a most malignant form, and patients suddenly die with profound sensorial derangement, when supposed to be quite free from danger, and even after the case has reached convalescence; even under very favorable circumstances, there is a liability to secondary affections. In some persons there is an extraordinary tendency to the most violent forms of scarlatina, and in such the prognosis is always more unfavorable than in others, and special care should be taken to guard them, until the susceptibility may be supposed to be worn out with age. The disease is generally dangerous in pregnancy and the puerperal state. Cases occurring among men, are more prone to a fatal issue than

those in women, except in the circumstances above mentioned. In judging of the prognosis in any particular case, reference should be had to the character of the epidemic.

Among the unfavorable symptoms are a late appearance, a deficiency or sudden retrocession of the eruption, continued delirium, a livid or purple color of the rash, with petechiæ, ecchymosis, or hemorrhage, a livid appearance of the fauces, with gangrenous sloughs or ulcers, extension of the pseudo-membranous exudation into the larynx, gangrene of the extremities, and great prostration.

Treatment.—In the treatment of scarlatina, as well as all other diseases, proper attention should be paid to the condition of the stomach and bowels. If the stomach be loaded with vitiated ingesta, it should be evacuated by means of a full lobelia emetic; the bowels washed out either by warm water enema, or some mild purge. The surface should be thoroughly cleansed, either by means of a hot bath, or sponging with tepid soda water. In the simple form of the disease, but little farther is necessary, although it is usually advisable to aid elimination from the surface by adding five or ten drops of the tincture of belladonna to a tumbler of water, and administering a teaspoonful every half hour. If there be fever, a similar quantity of the tincture of aconite may be added to another tumbler of water, and administered alternately with the belladonna.

In the *anginose* form, in addition to the above treatment, hot packs should be applied to the throat, and frequently changed; and if there be much œdema, the throat should be bathed frequently with the heavy petroleum, followed by packs as hot as they can be borne. If there be inflammation of the fauces, the throat should be gargled with a warm decoction of hydrastis Canadensis; and if there be ulceration, they should be frequently touched, by means of a probang, with an ointment, formed by adding one dram of muriate of hydrastia to a dram of glycerine. If there be much constitutional disturbance, with a tendency to depression and putrescency, one grain of capsicum, in combination with half a grain of hydrastin and sulphate of quinia, should be given in a teaspoonful of cream every two or three hours, for two or three days. If there be much irritation of the surface, the entire body should be anointed once or twice a day with equal parts of lime water and sweet oil, to which a few drops of creasote have been added. Previously to each ap-

plication of the ointment, the patient should take a warm soda bath. If there should be a recession of the eruption, macrotin, scrophularia, bryonia, and warm ginger tea, should be used with freedom until it is again transferred to the surface. In case there is great œdema of the fauces, with ulceration or pseudo-membranous exudation, I have found almost immediate relief to follow the application of a hot tincture of capsicum to the fauces, by means of a probang. I have also, in some cases, where there were gangrenous appearances, touched the ulcers with a weak solution of nitro-muriatic acid to advantage. The compound tincture of myrrh, capsicum, and lobelia, applied to the external surface, followed by hot packs, has also been found beneficial.

In the treatment of *scarlatina maligna*, the great effort of the practitioner should be to establish a most thorough and complete reaction, as it is in this disease that the overwhelming sedative influence of the poison so paralyzes the vital forces as to jeopardize the life of the patient in the early stage. This influence must be counteracted by means of a most thorough stimulating and invigorating course of treatment. I have been in the habit of immersing the patient in hot water, at the same time giving a full dose of capsicum, say, from two to five grains, combined with one or two grains of xanthoxylin, every half hour, or more frequently, as the case might indicate. As soon as the patient is removed from the hot bath, the surface should be thoroughly rubbed with the compound tincture of myrrh and capsicum, hot sinapism, applied to the spine, abdomen, and extremities. If re-action be not soon established, in addition to the other stimulants, large draughts of hot ginger and capsicum tea, or brandy toddy, should be given. Carbonate of ammonia, camphor, and the inhalation of oxygen gas, are also means that have been resorted to with benefit. This form of scarlatina is mostly associated with malarial affections, and as soon as re-action is established should be followed by a full round of antiperiodic medicine; after this the treatment is essentially the same as that recommended in the anginose variety. To obviate the unpleasant sequelæ of this disease, the congestion of the kidneys should be removed by means of helonin; this will prevent the dropsy, while iron, vegetable tonics, and a liberal diet, will usually re-organize the blood.

DIPHTHERIA, OR DIPHTHERITIS.

I regard diphtheria as one of the modifications of scarlet fever. I came to this conclusion after the most thorough investigation of nearly every form. The reasons for these conclusions are the striking resemblances of the diseases in many particulars, and the still more positive evidence that diphtheria frequently assumes the character of simple scarlatina; while, in other cases, scarlatina not unfrequently is converted into genuine diphtheria. My attention was first called to this subject some six years since, while treating a case of diphtheria in a family where there were five children. The two oldest had diphtheria. Some five or six days after, one of the youngest was attacked with scarlatina; and although they had not been exposed in any way only to the diphtheria patients, it passed through all the stages of genuine scarlatina. The next case was that of the fourth child, who had diphtheria. The cases so attracted my attention, that I at once instituted a most careful investigation, relative to the identity of the two affections, and soon found that the diseases were not only closely allied, but that they sprang from the same cause, and were identical in nearly every particular.

But, in order to obtain fuller understanding of these hitherto supposed independent affections, let us analyze their respective symptoms. In scarlatina, the child is seized with rigors and chills, lassitude, debility, albuminous urine, quick, wiry pulse, light, furred tongue, a hot, dry, and pungent skin, and in the anginose form of the disease, with congestion of the fauces, thickening of the lymphatics about the neck, and, not unfrequently, more or less catarrhal symptoms. In diphtheritis, the patient first complains of lassitude, headache, loss of appetite, has rigors and chills, albuminous urine, active and quick pulse, a light, furred tongue, redness of the fauces, enlargement of the lymphatics about the neck, a hot, dry, and pungent surface; and, in most cases, a copious exudation from the mucous capillaries of the upper air-passages. This exudation soon becomes organized; and patches of white, tough, fibrous membrane may be observed on the uvula, soft palate and tonsils. It will be observed that the only essential difference in the general symptoms of scarlatina and diphtheritis are those which

relate to the local affection, or the peculiar inflammation of the throat; and, even in this respect, in the anginose form of scarlatina, the symptoms are almost identical, with the exception that in genuine diphtheritis the exudation becomes converted into fibrous tissue, constituting the formation of the false membrane, whilst in scarlatina anginosa it is converted into pus corpuscles, producing a solution of the continuity of the tissue, and the formation of ulcers. Even in diphtheritis, the existence of the membrane does not always prevent a solution of the sub-adjacent tissue, as I have seen many cases in which the membrane has been perfectly organized, but which became absorbed or disorganized in the brief period of from twelve to twenty-four hours, leaving deep, ragged, purplish ulcers. Again, as I compare the sequel of the two affections, I observe that in diphtheria the blood becomes disorganized, the kidneys granulated, the muscles soft, the nervous system prostrated, together with paralysis, albuminuria, dropsical deposits, and a general derangement of the gastric and hepatic functions. In cases where there is extensive œdema of the glands and tissues of the neck, ulcerations and chronic abscesses not unfrequently constitute a part of the subsequent difficulties. In scarlatina anginosa, and scarlatina maligna, I find all these conditions existing as the result of the acute form of the disease, and in the sequel of the two affections there are still less marks of distinction.

Cause.—When I came to examine into the nature and cause of scarlatina, I observed the records almost uniform in attributing it to a peculiar or specific miasm, the precise nature and character of which they do not fully understand. This *materies morbi*, when introduced into the blood, either by endermic absorption or by inhalation, produces a series of morbid changes in the fluids, organs, and tissues, which is denominated scarlatina. When the poison acts with moderate intensity, and the recuperative and the eliminating powers are vigorous, its severity is so modified as to constitute scarlatina simplex. In this simple form of scarlatina, as I have previously stated, the poison appears to be eliminated through the skin with such vigor, as to very essentially preserve the integrity of the general organism. On the other hand, scarlatina anginosa is produced by a more intense impression of the specific poison upon the system by a less vigorous, recuperative, and eliminative force,

and by the concentration of the *materies morbi* upon the mucous membrane, lymphatic, and adjacent tissues of the throat; whereas, in scarlatina maligna, the overwhelming sedative impression of the virus upon the cerebro-spinal centres, produces great prostration, rapid disorganization of the fluids, and death, unless its intensity be modified by a most energetic and vigorous course of medication. In scarlatina diphtheritis, the specific poison, as in the case of the anginose variety, is concentrated upon the fauces, producing inflammation and the organization of the exudation.

Diphtheria assuming the form of Scarlatina.—A child of Mrs. Z., aged three years, was seized with all the symptoms of diphtheria. Upon inspecting the fauces, a white, tesselated exudation appeared upon various portions of the mucous surface. Twenty-four hours afterwards, on examining the membrane, it was found perfectly organized, and extending into the lateral nasal passage and larynx. A hot bath, stimulating friction, hot packs to the throat, macrotin, quinine, and acetic syrup of sanguinaria, soon disorganized the membrane, relieved the throat symptoms, and produced a diffused scarlatina erythema over the entire surface. After this, the case was treated as scarlatina simplex, and had an early and rapid convalescence.

The history of the above case is but a sample of a large number which have occurred in my practice within the last four or five years, where, by an energetic treatment, all the symptoms of diphtheria have been reduced to those of simple scarlatina.

Scarlatina converted into Diphtheria.—While diphtheria frequently assumes all the symptoms of scarlatina, the latter, on the other hand, not unfrequently takes the character of the former.

A daughter of Mr. Z. was attacked on the 25th of November, 1862, with chills, fever, lassitude, headache, and loss of appetite, which was followed by scarlatina erythema on the morning of the 26th. On the evening of this day angina made its appearance, and on the next morning the fauces were completely lined with a diphtherial exudation. During this period the scarlatina erythema had entirely disappeared, and the disease presented all the symptoms of general diphtheria. Upon the administration of metastatic remedies, however, the erythema again made its appearance, connected with a mitigation of all the throat difficulties. What has

occurred in this case, has frequently been noticed in others; so that during the prevalence of diphtheria in this city, Philadelphia, in 1861, '2, nothing was more common than to witness well-marked cases of scarlatina assuming all the characteristics of diphtheria. From these observations, and other concurrent facts, I am inevitably led to the conclusion that diphtheria is only another modification of scarlatina.

Symptoms.—Diphtheritis usually commences with loss of appetite, lassitude, general debility, pain in the head, constipation, scanty urine, and fever, alternated with chills. In some cases, the constitutional symptoms are very slight, and do not make their appearance until after those of the throat. The first manifest difficulty of the throat is slight soreness, and difficulty of swallowing. As the disease advances it becomes painful, and swallowing extremely difficult. In the commencement of the disease, there is, usually, an extensive discharge from the mucous capillaries, of a thick, plastic matter, which is expectorated with considerable difficulty. Upon examining the throat, it will be found red, swollen, and the capillaries largely distended with blood. In patches there will be found a whitish, plastic substance, so firmly adhering as to be removed with difficulty. This membrane, as it is called, is the result of an imperfect organization of the albuminous portions of the blood, which have escaped from the diseased capillaries. In many cases, this abnormal transformation occurs before the blood leaves the capillaries, as upon microscopical examination of a section of the mucous membrane, before the diphtheritic deposit is removed, it will be found that the false membrane consists of a semi-fibrous structure, deeply imbedded in the capillaries themselves. While the organizable parts of the blood are thus being converted into adventitious structure, the fluid portion is making its escape into sub-cellular tissue, producing œdema, and offering serious obstruction to the respiratory passages. Hence, the breathing becomes hurried and difficult, the pulse quick, and, as a natural sequence, there is great restlessness and anxiety. In some cases, the membrane forms rapidly, extending to the tongue, and dipping down into the trachea, presenting a complication of symptoms characteristic of angina and pseudo-membranous croup. In other cases, there is an abortive attempt at the formation of the mem-

brane, the parts increase in redness and swelling, and assume the appearance of erysipelatous inflammation. In other cases, small aphthous patches make their appearance, and rapidly extend themselves to the sub-cellular tissue, constituting large and indolent ulcers. The symptoms of these different forms may vary, according to the severity of the case, and the age and constitution of the patient. The majority of fatal cases in the city, so far as I have been able to learn, occurred where the membrane extended to the trachea, producing asphyxia. In a few cases, the disease has terminated in gangrene and mortification, or in death from exhaustion. While in other cases, the throat symptoms readily gave way to a proper treatment, and to all appearance the patient passed through a favorable convalescence; yet the skin was sallow, the bowels irregular, and great debility. In a few cases, where these symptoms manifested themselves, the patient was attacked with paralysis of one or both of the lower extremities, together with a general softening of the entire nervous system. In other cases, instead of the paralysis, a softening of the nervous system appears to progress slowly, until the patient dies from general inertia; or, as has occurred in a few cases in my practice, the scarlatina virus continues to work its disorganizing influence on the blood, and other fluids of the body, until the patient either dies from dropsical effusion, or from an absolute disorganization of the blood. In a few cases, after these symptoms had continued for a time, the patient was seized with hæmoptysis, or hæmatemesis, and death soon terminated the patient's life. In other cases, I have known disorganization of the kidneys, liver, and lungs, to occur, and a long series of constitutional symptoms to exist as the result of the disease.

Anatomical Characters.—The mucous membrane of the pharynx, and, frequently, of the mouth, are either covered, or have patches of a fibrino-albuminous membrane of either a lightish grey or dark brown color, if it has not disappeared before death; and if it has, it presents a swollen or congested appearance. The tonsils show signs of inflammation, and are often found enlarged, and present a dark, congested appearance. The mucous membrane of the larynx and trachea is more or less covered with this membrane, and if not thrown off, it forms a perfect tube, the exact shape of the larynx and trachea, down to its bifurcation. The bronchial tubes are found

filled with fibrino-albuminous matter, in a viscid, unorganized state. The inner surface of the arteries, veins, and even the lining membrane of the cavities of the heart, are liable to be covered with it. The blood is of a dark color. Evidences of passive inflammation may be noticed, in some cases, in the lungs, pleura, mucous membrane of the alimentary canal and other structures.

Prognosis.—In mild cases, the prognosis is generally favorable, if they are treated properly, in time. In severe malignant forms, particularly if neglected in the early stages, the disease is more fatal. The unfavorable symptoms are great prostration during the forming stage, anorexia, a foul and putrid breath, a severe chill, extensive fibrino-albuminous exudation and the early development of typhus symptoms. The favorable prognostics are a slight chill, moderate exudation, of a light caste, and slight febrile symptoms.

Treatment.—The treatment of diphtheria does not differ, in many particulars, from that of scarlatina. When called to treat the case, in the early stages, it must be borne in mind that the affection is dependent upon a specific poison, and that, in order to eliminate it from the system, all the emunctories should be put into full operation. This can be done by giving a spirit sweat, a thorough emetic, followed by an active purge of podophyllin and antibilious physic; after which the barosmin or apocynin should be given, to keep the kidneys in vigorous operation, and aconite to maintain free perspiration. To remove the local affection, flannel clothes, wet in the compound tincture of myrrh, capsicum, and lobelia, should be applied to the neck, over which should be placed a hot pack. The pack should be changed as often as every half hour, and applied as hot as the patient can bear it. As soon as the purge has operated, the patient should be placed in bed, and jugs of hot water applied to the feet, and metatastic remedies given for the purpose of diffusing the poison on the skin. Among the best medicines for this purpose are the macrotin and scrophularia. My method of giving these medicines is to add to a half tumbler of water, one dram of the saturated tincture of scrophularia, and give a teaspoonful every hour. Add to another tumbler, twenty grains of the triturated macrotin, and give one teaspoonful every hour. Alternate the medicines, so that one or the other will be given every half hour. If there is much inflammation in the throat, a gargle

of the hot decoction of hydrastis canadensis should be frequently used. If, after pursuing the above treatment for twenty-four hours, the disease should not assume a favorable aspect, ten grains of quinine, five of hydrastin, and ten of capsicum, may be made into ten powders, and one given every two hours, in connection with the other remedies. When the membrane has become fully organized, and shows a disposition to extend, the acetic syrup of sanguinaria, either alone or in combination with other remedies, will prove valuable. In a few cases, when the membrane has proved an incumbrance to the arterialization of the blood, I have applied a strong solution of the hot sulphate of zinc, by means of a probang. In cases where deep aphthous patches presented themselves on the mucous surface, with a disposition to ulceration, rhusin and baptisin, either alone or in combination, used as a gargle, and small doses introduced into the stomach, will soon arrest its progress. If the breathing should be difficult, a free emetic of the acetic tincture of sanguinaria and lobelia should be given. The surface of the body should be frequently sponged in hot soda water, and the patient allowed a liberal quantity of soft, nutritious food. After the active stage of the disease has passed, the eliminating process should be continued by constantly stimulating the various emunctories of the body, and the system freely supported by alnuin, iron, hydrastin, and other tonics. If softening of the nervous tissue occurs with paralysis, hypo-phosphoric acid, in doses of five or ten drops, in combination with cypripedin, given once or twice a day, will have a tendency to relieve the difficulty. If paralysis exists, from the one-sixteenth to the one-tenth of a grain of Keith's strychnin, in combination with two or three grains of hypo-phosphite of iron, given three or four times a day, will prove of value. When the disease produces softening of the mucous membrane of the stomach, bowels, bronchia, &c., &c., one dram of the chlorate of potassa added to six ounces of syrup of hydrastis canadensis, given in doses of one teaspoonful every three hours, is a valuable remedy. When there is leucocythemia, and other diseases of the blood succeeding the disease, I have found the following a most valuable remedy:—Take leontodin, ten grains; alnuin, twenty grains; iron by-hydrogen, one dram. Mix. Make twenty powders. Dose, one four times a day, in a table-spoonful

of cod-liver oil. At the same time allow the patient to take freely of cream, into which a small quantity of capsicum has been introduced. In cases where there is granulation of the kidneys, with albuminuria and dropsical deposits, hot stimulating baths, together with a proper use of helonin, apocynin, and ampelopsin, will usually effect a cure. If, after the diphtheritic deposit on the mucous membrane is removed, ulceration should occur, the chlorate of hydrastin should be used, as a gargle, and by means of a probang; and the external surface kept constantly excited by means of a stimulating liniment and hot packs.

In several cases, where there has been extensive œdema of the fauces and great difficulty of breathing, the sub-marine plant oil, applied to the throat by saturating it in raw cotton, together with twenty or thirty drops taken internally every half hour or hour, has produced immediate relief. Where there is erysipelatous inflammation, with gangrenous ulceration, a strong decoction of capsicum applied to the ulcers, as hot as can be tolerated, by means of a probang, will promptly arrest the disease. Where there is decomposition of the blood, two drams of chlorate of potash, dissolved in four ounces of water, compounded with the same quantity of the elixir of cinchoniæ and iron, given in tablespoonful doses every two or three hours, have proved serviceable.

During convalescence, the diet should be nutritious, and baths, fresh air, and a liberal amount of fresh fruits prescribed.

RUBEOLA, OR MEASLES.

Rubeola, or Measles, the Rougeole of the French, the Morbilli of Sydenham and other old authors, is an exanthematous disease, characterized by the following symptoms:—A fever, with catarrhal implication, which, at the end of seventy-two hours, throws out an abundant eruption, consisting of minute confluent papulæ, slightly elevated above the surface, and subsiding in three, or at farthest, in four days; the catarrhal symptoms, in all normal cases, declining on the appearance of the eruption, but sometimes, especially in severe and irregular ones, continuing, or merging into those of pneumonia. The disorder, for the most part, occurs to all mankind once in the course of life; but having been undergone, the constitution remains for ever after comparatively unsusceptible of the same disease.

But we will describe the symptoms more fully. There is slight tenderness and redness of the eyes. There is epiphora, the great diagnostic on which nurses are wont to rely. While the measles are developing, you will be sure to find the window-blinds down, and the curtains of the bed closely drawn. The slightest ray of light is painful. There is irritability of the retina, sometimes attended by inflammation of the conjunctival membrane. There is frequent sneezing, indicating a gorged and irritable state of the schneiderian. There are a loud, dry, hollow, and incessant cough, (*tussis sicca*) watery discharges from the nostrils, together with hoarseness, (*raucedo*) slight, creeping chills, and flushes of heat. In some cases the catarrhal symptoms precede, while in others they do not appear until the second day of the fever. The lymphatic glands along the neck sometimes become swollen and tender. About the third day considerable nausea and vomiting are apt to occur; and if there be much fever, slight delirium may take place. In severe cases, slight coma may precede the appearance of the eruption; and convulsions are not uncommon in young children, particularly if the fever be of a high grade, the pulse being full, hard, and quick, and the skin hot and dry. Generally, about the fourth day, the eruption appears.

The appearance of measly eruption is very characteristic. It comes forth in a full crop, and rapidly reaches its climax. In regular measles the face is always first affected.

When closely examined, the eruption is found to consist of a congeries of minute papulæ, close-set, or confluent, and for a short time perceptibly elevated above the level of the surrounding skin. This elevation, or roughness, is most perceptible on the forehead. On the limbs it is scarcely to be detected. The color is a dingy red, very different from the bright scarlet hue of its rival. Hence the French name rougeole, or fievre rouge. The difference in color may easily be traced to the tracheal and bronchial complication so generally present in measles, which, extending partially into the substance of the lungs, gives a venous character to the blood. In scarlet fever, on the other hand, the lungs are unaffected, while there is intense arterial action. The eruption, therefore, partakes strongly of the character of arterial blood.

The development of eruption is very often accompanied with

moist state of the surface. This is the normal mode of development, and of course always to be desired. Few, if any cases that begin thus, end unfavorably. The same thing is true of all exanthematic disorders. In a hot and dry state of the surface, eruption is difficult, partial, and imperfect.

On the second day of the eruption, the fifth from the occurrence of rigors the eyelids often swell, from the extension of cutaneous action to the subjacent cellular tissue. Although I have never seen such a thing, I have heard of children blinded by measles during the space of four days. The progress of measly eruption, in all normal cases, is steadily from above downwards. On the second day of the eruption the trunk and upper extremities are occupied. On the third day it has extended to the lower extremities, by which time it has nearly disappeared from the face. On the sixth day it has faded over the whole surface.

The sequelæ, or dregs, of measles, require as much study as the earlier periods of the complaint. I have described the normal progress of measles in perfectly healthy subjects. I am now to trace its effects on weakened and scrofulous constitutions. Generally, in such habits, something occurs early to give cause of uneasiness. The initiatory fever has been severe. The eruption has been retarded twelve or twenty-four hours. It has receded and returned. Epistaxis, or an epileptic fit, or diarrhœa, has occurred to interrupt the normal course of the disease, and warn you of impending danger. Above all, in such constitutions the catarrhal symptoms do not subside on the outbreak of the eruption. The cough continues. The child becomes restless. Careful observation detects dyspnœa. The stethoscope gives signs of impeded respiration. Instead of the febrile symptoms subsiding on the sixth day, and the child expressing its desire to get up and have its toys, the little sufferer continues to droop. Its hands are hot, its nights unquiet. It is thirsty, and the urine is scanty. Secondary fever has set in.

Pneumonic complication occurs, both in the progress of the eruption and during its decline. It is a slow, creeping, insidious form of inflammation, which too often throws the practitioner off his guard. No positive complaint is made. The child droops, and appears weak and exhausted. Imagining that the disorder has weakened his patient, the practitioner directs some mild tonic. Mean while, pneu-

monic engorgement, or pneumonia in its first stage, creeps on. The lungs become more and more congested, and at length solidified. A convulsive fit now takes place. Alarm is taken, but the mischief is irreparable. Dyspnœa increases. The child becomes drowsy, the feet cold. The pulse sinks. Fluid effusion now takes place from the bronchial membrane. Another and another fit succeeds. Rattles are heard in the throat. The child dies!

Sequelæ.—The diseases most liable to occur after measles are pneumonia, croup, ophthalmia, otitis, arachnitis, bronchitis, phthisis, and a general scrofulous condition of the system.

Ophthalmia frequently follows measles, and proves of a very difficult nature to treat. It is indicated by an inflammation of the conjunctiva, followed by a muco-purulent discharge, and which extends to the adjacent tissues, assuming a chronic, and, in some cases, an ulcerative character.

Phthisis, as an effect of measles, is one of the most common forms of the termination of the disease. It is produced by the miasmatic poison, so contaminating the blood as to cause tuberculous degeneration of its albuminous constituents, and a general softening of the mucous membrane, not only of the bronchi, but of the stomach, bowels, and even in some cases extending to nearly every portion of the mucous lining. The softening of the mucous membrane of the stomach and bowels, most essentially impedes the healthy digestion, and contributes largely to the development of the disease.

When phthisis occur as the effect of measles, the only distinguishing features that characterize this form from most others, are the rapid tendency of the disease towards its fatal results; and the more marked dyspeptic symptoms, together with a loss of function of the entire mucous tissue. Dropsy, scrofula, dyspepsia, uterine diseases, and other affections are developed as the result of the disorganizing effects of the morbific virus upon local organs and tissues, and are amenable to the same general treatment.

Diagnosis.—Measles may be confounded with catarrhal fevers, variola, roseola, and scarlatina. It may be distinguished from catarrhal fever, by the peculiar hoarse cough, and by the appearance of the eruption. From small-pox, rubeola may be distinguished by the catarrhal symptoms being greater, by the eruption being less

prominent, and not passing into a vesicular and pustular state, and by the continuance of the fever after the appearance of the eruption. In roseola, the catarrhal symptoms are not present, unless the disease be associated with catarrh, in which case all the extrinsic circumstances should be taken into account. In scarlatina, there are no catarrhal symptoms, the eruption is more diffused and uniform, consisting of an infinite number of minute red points united together, which appear on the first and second day of the fever.

Anatomical Characters.—When measles prove fatal, it is generally owing to inflammatory disorganization, the signs of which, therefore, will be found after death. When death results from the uncomplicated disease, nothing is found but a general congestion of the internal organs, and especially of the mucous membrane. The blood in the vessels is fluid and blackish.

Prognosis.—Measles are not usually dangerous, unless they assume a highly inflammatory, congestive, or malignant form. When the inflammation extends to the brain, larynx, trachea, or bowels, the disease may terminate fatally. The chief danger is from bronchial and pulmonary inflammation. The occurrence of pseudo-membranous croup is highly alarming. The danger is greater in the aged, and in cold than in warm weather, and is aggravated by dentition, pregnancy, and the puerperal state. Among the unfavorable signs, are unusual severity of the fever, postponement of the eruption, a sudden disappearance of the rash, great prostration, severe dyspnœa, restlessness, delirium, coma, loss of voice, livid color of rash, petechiæ, and passive hemorrhage.

Treatment.—The treatment of measles, during the early stage, consists in giving a mild emetic and purge, after which the patient should be kept in a warm room, or at least where there is no danger of taking cold, and the following metastatic remedy given:—Take macrotin, ten grains; white sugar, one dram. Triturate, and add to a tumbler of water, and give one teaspoonful every hour or two, according to the character of the eruption. If the eruption be fully developed on the surface, but very little is required. On the other hand, if it be easily repelled, or manifests a faded appearance, it should be given more freely. In cases where the eruption does not appear freely, and there are active catarrhal symptoms, one grain of quinine, and one-eighth or one-fourth of a grain

of pulverized lobelia seed, or what is better, the oleo-resin of lobelia, should be given. If that does not allay the bronchial and pulmonic irritation, a few doses of the acetic syrup of sanguinaria, either alone or in combination with the quinine and lobelia, will answer the purpose. If the above treatment does not produce and maintain the eruption of the skin, from five to ten drops of the saturated tincture of scrophularia marilandica, in hot milk punch, or if there be inflammatory symptoms, given in water, should be administered and followed by a hot bath. In cases where the constitution has been debilitated by previous disease, or where there is a scrofulous or phthisical habit, iron, alnuin, myricin, and frazerin, in such forms and quantities as the case may require, should be given. During the convalescence the patient should drink freely of tonic tea four or five times a day. The skin should be kept active, the bowels open, and kidneys free, so as to prevent the accumulation of the rubeola poison in the fluids. In cases where the disease has assumed a chronic form, and the lungs, stomach, kidneys, or bowels, are involved, all the most vigorous resources to restore the emunctories should be resorted to, and the local difficulty combated with such remedies as will remove the inflammation, and restore the organ involved to its original condition. In cases where there is evidence of accumulation of the poison in the blood, apocynin, given in half grain doses every two or three hours, will eliminate it from the system. A case which recently came under my charge, was that of a young lady, of a strong phthisical habit. She was seized with measles, which ran a mild course, and subsided on the eighth day. Some two weeks afterwards she was attacked with cough and bronchial irritation, accompanied with great prostration, imperfect digestion, and rapid emaciation. Upon examining the sputa, it was found to contain an abundance of tuberculous granules. Dullness was manifested upon percussing the apex of the lung, and auscultation indicated rapid infiltration of tuberculous matter into the pulmonary tissue. The case was evidently one of phthisis, excited by the depressing influence of the rubeolar virus in the system. I instituted the following treatment:—Take apocynin, five grains; ampelopsin, ten grains; ferri hypophosphite, twenty grains. Mix. Make twenty powders. Dose, one every two hours, in a teaspoonful of cod liver oil. A warm friction bath was ordered every day, and a

nutritious diet. Under this treatment the symptoms became somewhat mitigated; yet there remained an irritable cough, copious expectoration, and great debility of the digestive organs. To cure these, the following was ordered:—Take prunin, ten grains; alnuin, twenty grains; sacch. alba, one dram. Mix. Make twenty powders. Dose, one every three hours, in a teaspoonful of cod liver oil. In connection with this treatment, I ordered an ounce of tonic tea, and one dram of the carbonate of iron to be added to a quart of the best Port wine, and one wineglassful to be taken before each meal. Under this treatment the patient rapidly recovered. When a strong phthisical or scrofulous habit exists during the early stage of measles, every effort should be made to maintain the eruption on the skin, and support the constitution until the disease is entirely eliminated from the system. In cases where measles has been followed by chronic ophthalmia, in connection with the proper internal treatment, I have prescribed the following:—Take pyruscin, ten grains; hydrastin, five grains; glycerine, one dram. Mix. Form a paste, and apply to the inflamed portion of the eye by means of a camel's hair brush, four or five times a day. During the treatment of all the forms of chronic measles, a nutritious diet, and a well-regulated regimen, will contribute much to the cure.

SMALL-POX, OR VARIOLA.

Small-Pox, or Variola, from the Latin *varius*, spotted, demands special consideration.

History.—The Greeks and Romans knew nothing of this disease. The first notice of any affection resembling small-pox is found in a chapter of Procopius, "De Bello Persico," in which he describes a dreadful pestilence, which began at Pelissium, in Egypt, about the year 544, spreading towards Alexandria and Palestine. This disease was accompanied by buboes and carbuncles. It raged independently of all seasons, spreading into Persia, and through the whole interior of Asia, sparing neither age nor sex, and being peculiarly severe in pregnant women. Whether this epidemic was really small-pox, may be doubted; but certainly, shortly afterwards, very unequivocal traces of it were met in the countries bordering on the Red Sea, for we read of caliphs and their daughters being pitted. It had certainly been known for several centuries before it was pre-

scribed. Rhazes, in 910, was the first author who mentioned it. From the East it travelled to the West, appearing in England towards the close of the tenth century. In 1492 it made its appearance in America, first occurring in Mexico, and in 1666 in Boston, and subsequently all over the United States.

Inoculation was first practised in 1700, at Constantinople; but it was not until Lady Mary Wortley Montague had her daughter inoculated in 1721, that the attention of the profession was called to the experiment; and even then, she could not prevail upon them to adopt it, until its utility in modifying the disease, had been repeatedly demonstrated. Inoculation had a powerful influence in modifying the severity of variola; and up to the period in which vaccination was introduced by Dr. Jenner in 1770, small-pox had become much less prevalent and essentially modified in its character. Vaccination, however, has its evils as practised at the present day. Most of the virus used by physicians is that which has passed through the system of persons affected with scrofula, cancer, phthisis, syphilis, etc.; and from the frequency with which individuals, previously exempt from these diseases, are attacked after vaccination, we have every reason to infer that the virus is contaminated with those poisons, and, consequently, the profession cannot be too careful in procuring the genuine cow-pox, or the vaccine matter that has passed through the system of those who are entirely exempt from any constitutional contamination.

Symptoms.—The symptoms of variola are those which mark the four periods into which the disease is naturally divided.

The Period of Invasion.—This period usually occupies about three days, and is manifested by lassitude, languor, restlessness, gaping, stretching, petulant and sullen disposition, accompanied or soon followed by chills, rigors, and the usual symptoms of the cold stage of fevers. Towards evening these symptoms are succeeded by hot, dry skin, pain in the head, and scrobiculus cordis, which is increased on pressure, loss of appetite, nausea, and in some cases, vomiting and lumbago. During the second and third day the sleep is disturbed with troublesome dreams and sudden startings, with frequent horripilations or creeping chilliness, which are soon followed by heat, fever, flushed face, occipital headache, and, in children, with frequent convulsions.

The Period of Eruption.—At the end of the third day, or on the morning of the fourth, a series of small, red, circular points or papilæ, appear, in which form, the variolous eruption first presents itself. They are not prominent above the surface in which they are seen; but, by passing the finger over them, they can be easily and distinctly felt. They are of the size of a pin's head, are round, hard, movable and rolling under the finger, and are evidently situated in the substance of the skin. These minute, isolated, tubercular tumors, increase in diameter and prominency, advancing upon the surface, becoming slightly elevated above it, and gradually rising into distinct pimples. In the course of the first day, or by the time they are twenty-four hours old, they become rather globular in form, have a regularly-formed ring of inflammation at their base, and assume the appearance of rising pustules. They now go on increasing in breadth and elevation, and, on the commencement of the second day, present light, transparent specks at their summits. At the first inspection these shining, semi-pellucid specks appear as if they were the effect merely of the distention of their cuticular covering, caused by the rising pimple pressing against it, thus presenting a polished and glistening appearance; but they are, in fact, the seat of rising vesicles, for in the course of the second day, but sometimes not until the third day, the eruption loses its papular character, and becomes visibly and truly vesicular. The vesicles are at this period, however, confined to the tops of the pimples, and contain a drop of limpid secretion. During the eruptive stage the pimples are painful when pressed; and when they have reached their vesicular state, they seem to be planted upon well-defined tubercular bases, which are perfectly distinguishable by the touch. The inflammation attending the disease is of a phlegmonous kind; and the redness, both of the pimples and skin, subsides and disappears under the finger, and on stretching the surface; but the hardness and projection of the eruption continue to be felt and seen. The true seat and structure of the eruption, during the eruptive period, have been accurately ascertained by dissection. This has established, what indeed the sense of touch and other methods of examination had indicated, that the small-pox pustule is originally formed in the substance of the cutis. The little tubercles, soon after they are formed, are discovered, on dissection, to be located in the reticular tissue of the true

skin, occupying, as it were, little cells expressly formed for them. They resemble regularly-formed bulbs, are reddish exteriorly, of an ash color interiorly, and are evidently cellular. If, on the second or third day after their appearance, these bulbous tubercles are divided by incision, and examined by means of a magnifying lens, a minute quantity of a serous fluid may be discovered in them, retained by small, thin walls, or filamentous partitions; which have not, however, as yet the appearance of a regular and symmetrical structure. The febrile symptoms, on and during the appearance of the eruption, subside; and when the eruptive process is completed, the patient, particularly if it be a child, is frequently relieved from all the distress and uneasiness which attend the fever. The pains of the head, back, and loins, and the increased heat of the system, are much diminished, and occasionally entirely vanish. The eyes and tongue regain, in some measure, their natural appearance, the pulse becomes more regular, and the organs of digestion and of secretion resume, in a degree, their natural and healthy functions. Patients usually complain of soreness in the throat during the whole time occupied by the period of eruption, and this increases in degree as the pustules increase in size and number. As the eruptive process goes on, the regions which are successively invaded by the pustules, gradually swell and redden; and in grown persons the eruption is very frequently attended by a profuse and constant perspiration. After the breaking out of the eruption, the pocks, on whatever part of the body they may exist, pursue the same march, varying a trifle, perhaps, in appearance, in different regions, according as the texture of the skin differs in thickness and vascularity, and by the time those which first appeared become vesicular, those which succeed them are in different stages of progress, and the eruption consequently presents a variegated and multiform appearance. The pimples, after having passed into the vesicular form, as already described, increase in diameter and elevation; and by the fourth day the tubercles seem to have emerged entirely from the substance of the skin, and are quite prominent above, and are situated, as it were, upon its surface. Their whole superficies is now converted into a vesicle, which fills and assumes a rounded or hemispherical form, presenting soon a slight depression in the centre. This depression varies in degree in different pustules. In some it is quite

evident, while in others it is hardly perceptible, or does not exist. It is usually considerably deep in the eruption on the face, while that on the extremity remains rounded and globular. When the depression does exist, it is produced by an adhesion of the cuticular membranes to the inflamed cutis, in consequence of the effusion of coagulable lymph; which also forms a cyst to confine the matter, and thickens the rete mucosum and cuticle. The pustules, which are now of a pearl or ivory color, are surrounded by a red circle, and measure from one to two lines in diameter. They are tender on pressure, and are still distinguished by hard tubercular bases. They subside, but do not disappear, on pressure, or by distending the parts in which they exist. Their bases, however, communicate a hardness and resistance to the touch, whilst their superficies are comparatively soft and yielding. These peculiarities, however, are not common to all of the pustules at this epoch; some of them more readily give way under pressure, and are more yielding and elastic than others, owing probably in part to a greater comparative quantity of secreted fluid which distends them, and to some difference in the compactness of the texture in which they are situated. Dissection of the pustules, on the fifth or sixth day of their age, demonstrates that their structure is cellular, and that the cells are filled at this period of their progress with a diaphanous secretion, and that they are separated from each other by thin partitions, which converge to a central point. This structure is easily recognized in the superior portion of the pustule, by dividing it by a transverse incision from above downwards. The structure of the lower or deep-seated portion of it is more dense and compact; but is still cellular, and is of a deeper color than the superior, and contains a little fluid. In puncturing the pustules at this time, the secreted matter will usually flow out at once; which shows that although it is contained in cells, yet these are not distinct from each other, but that there is a free opening and communication among them. The pustules vary considerably in size, age, and general appearance. When about five days old, they are hemispherical in shape, are bounded by a red circle, and their fluid contents gradually assume an opaque and turbid appearance. While these changes are taking place in the pustules, which are the first to break out, those which succeed them gradually pass

through the same changes, and the parts which are thickly studded with them inflame and swell, and frequently acquire a damask rose color. As the pustules increase in size, and become filled with matter, the immediate spaces inflame, and become infiltrated with effused lymph, which occasions some general swelling of the cutaneous surface. The eyelids are the parts which first begin to swell, and they frequently swell to so great an extent as to close the eyes, and produce temporary blindness. In some instances, they are so much infiltrated and distended, that they resemble shining, inflated bladders, drawn over the eyes. The other parts of the face soon swell in proportion, and present a polished and bright red surface. The swelling of the face is sometimes so extensive, that its general outlines are completely destroyed, and the peculiar features of the individual are no longer to be recognized. Immediately after, the face, the hands, the fingers, the body, and the feet swell in proportion to the number of the pocks which are on them. The whole head is, at the same time, tender and painful, and it is with much suffering that the patient raises or moves it.

Period of Suppuration.—As soon as the suppurative process takes place, the surfaces of the pustules begin to lose their smooth and semi-transparent aspect, and to grow rough and whitish. This is the first sign of commencing suppuration. As maturation proceeds, the complexion of the pustules continues to grow more opaque, and to assume successively a milky and light straw, or cream color. During this process, small, well-defined, circular specks, darker than the rest of the surface, appear in the middle of most of the pustules. These little specks, on the first formation, are rendered very apparent by means of a magnifying lens, and the cuticle which covers them appears somewhat dry, and slightly scaly. They increase in size, from the centre to the circumference, until the whole superficies of the pustules assume, in a measure, the same opaque and purulent appearance, and until desiccation actually commences. At this period of their progress, the pustules cease to communicate that resistance to the touch which distinguishes them during their vesicular state; and, instead of feeling firm and hard, they are now comparatively soft, and the matter in them evidently fluctuates under the pressure of the finger. The fever, which subsided on the breaking out of the eruption, re-appears at the com-

mencement of suppuration, and rages with greater or less violence till desiccation takes place. It is announced by chills, which are succeeded by heat, headache, quick and hard pulse, thirst, furred tongue, by a disposition to sleep, coma, and sometimes delirium. The parts which are the most thickly studded by the pustules, are commonly the most swollen, inflamed, and painful. The hands and feet of children usually swell considerably, even when there are but few pustules on them, and adults are almost constantly troubled with a free, and frequently a profuse salivation. The secretion of saliva is attended with hoarseness and pain, and a peculiar and very disagreeable odor. The urine is commonly high-colored and muddy; and the dejections are frequent and liquid in children, while in adults they are often suppressed and hard. The general symptoms continue with varied severity, until the pustules on the different regions of the body become entirely maturated, and commence to desiccate. The pustules on the face, or those which first break out, are the first in which suppuration commences, and are soonest completed. Those on the extremities are the last to suppurate. As the pustules on the different regions, and even on the same parts of the body, do not pass into their suppurative stage all at the same moment, but at different times and in succession, the eruption consequently exhibits a variegated appearance at the time that the oldest pustules are in a state of complete suppuration. As soon as desiccation commences in the pustules, the febrile symptoms abate, and vanish as the process of scabbing proceeds. The areolæ surrounding the pustules, and the swelling and turgescence of the parts on which they exist, decline, and soon disappear. The scabs fall from the face from the twelfth to the fifteenth day after the appearance of the eruption, and from the fifteenth to the eighteenth from the commencement of the febrile attack. In the course of two or three days more, the scabs on the other parts of the body fall off. Such are the usual symptoms and appearances of small-pox in its distinct form.

Variola Confluens.—In the other form of the affection, however, which is called variola *confluens*, the pustules are very numerous and run together. The feverishness is infinitely more violent, and rather of a typhoid character; the pulse is not as strong, the patient is exceedingly weak, and there is delirium. There is

often so violent an affection of the head that coma is produced; and the eruption not unfrequently begins early, even on the second day. The pustules are not only far more numerous, but they are smaller, flaccid, and not filled as they should be. Their quality, also, is bad; for instead of containing a creamy, "laudable" pus, the contents are brown, perhaps thin and serous; or there may be a brownish, ichorous fluid. They not only run together, but, from not being well filled, appear more or less flat.

Attendant Symptoms.—The feverishness, in this form of the disease, is very little lessened on the appearance of the pocks; and at the end of the eruption is very much aggravated. Secondary fever, of a very violent character, now commences. The symptoms occurring in other parts are also very severe. There is much more running from the mouth, and inflammation of the fauces, than in the distinct form; and, in infants, there is sometimes violent diarrhœa. In this latter instance, the lower part of the alimentary tract suffers great irritation. Frequently, too, between the pustules, there are petechiæ, vibices, and ecchymoses. Sometimes there is bloody urine, and occasionally blood appears in the evacuations. The secretions are very unhealthy; and there is an exudation all over the body, so that the person emits a very offensive odor. Now and then, patients laboring under this form of the disease, die rather suddenly. The consequences of this species of the disease, too, are more severe than in the other form. In fact, it is "variola *confluens*" that, for the most part, leaves such terrible consequences; such as blindness, phthisis, and diarrhœa; the latter of which ends in ulceration of the intestines.

Complications.—Such are the ordinary phenomena of the natural small-pox, in its distinct and confluent forms, when it occurs in persons previously in good health, and of sound constitution. But it must be remembered that this disorder may attack those who are laboring, at the time of seizure, under some other disease, such as pneumonia, hooping-cough, hepatitis, or consumption; and, farther, that these and other disorders may come on, unexpectedly, at any period, early or late, during the progress of small-pox. An infinite variety of accidental symptoms may thus be superadded to the regular ones already enumerated. Small-pox may occur in persons of a weak habit, or in constitutions exceedingly exhausted,

and unable to cope with a disease of such severity. It may occur, for instance, in those who have but recently recovered from a severe typhus or scarlet fever. In these circumstances we observe a very tardy eruption; collapse, without advance or eruption; or, in a case somewhat more favorable, an abundant formation of large blebs, containing a thin ichor, with a very tedious and hazardous period of convalescence. To this latter form of the disease the old writers gave the name of the "*watery*, or *bladder*-pock."

The disease rarely occurs more than once; and, although we may all see instances of its secondary appearance, yet these are exceptions to the general rule. Like measles, however, and scarlatina, it *may* occur more than once.

Co-existent with Measles.—It was a dogma of John Hunter, an assertion without proof, that no two specific diseases could exist, at the same time, in the same body; but this is untrue. We see persons laboring under itch and syphilis at the same time; and there are plenty of instances on record, of small-pox co-existing with measles and cow-pox; though, in general, one disease runs its course in the body, and then the other. It is mentioned in the "Edinburgh Medical Commentaries," that measles and small-pox occurred, simultaneously, in sixteen children. Out of forty-three children who were inoculated, sixteen were at the time laboring under measles; and both the diseases went on together. This occurrence took place at the Foundling Hospital in Dublin.

Effects.—Pustules frequently form around the eyes, and on the cornea itself; and there is often ophthalmia, which not unfrequently, in the violent forms of the disease, produces albugo, or staphyloma. Formerly, a great number of persons were rendered blind by small-pox. When the disease is over, it frequently leaves scrofula. Persons may have enlarged glands of the neck, or of the mesentery, or they may have phthisis. Frequently it leaves rupia and ecthema. Diarrhœa, too, often follows, and the mucous membrane of the intestines assumes a chronic inflammation.

Cause.—The cause of variola is universally admitted to be a specific contagion. It is one of the most contagious of diseases, and may be communicated by inoculation, or by a miasm emanating from the body. There are very few, not protected by vaccination, or a previous attack of the disease, who are not liable to be seized

upon exposure. Even the fœtus, in utero, may be affected along with the mother. A very transient and slight exposure very often produces it. Thus, it is frequently taken by passing persons in the street, in churches, halls, or public conveyances, who have been recently affected. It is communicated in all stages, but most particularly so during those of suppuration and desiccation. The contents of the vesicles, pustules, and the scabs formed by the latter stage, contain the virus, and the miasm not only emanates from the cutaneous surface, but from the expired breath. Some suppose that the odor is connected with the contagious effluvia. The contagious principle attaches itself to clothing, which retains it for months, when confined; but it is easily dissipated in the air, so as to become inert.

The susceptibility to the disease exists in all ages, but is greatest in children. One attack protects the system, generally, from any subsequent one, although it cannot be denied that fatal cases often occur, in which the disease has appeared twice, or even a third time.

Diagnosis.—The diagnosis of small-pox presents no difficulty after the characters of the eruption are fully presented. The only diseases with which it is likely to be confounded, are measles and chicken-pox; but the eruption of measles is less prominent, and does not pass on to a vesicle and pustule, as in small pox. The duration of the eruption, in chicken-pox, is shorter, and the vesicles do not present an umbilicated appearance, as is the case in variola.

Morbid Appearances.—There is softening of the undermost layers of the cuticle, and, at a later period, destruction of the connection with the cutis. The pit or umbilicus is produced by the retention of the cuticle by the excretory ducts of the cutaneous glands, and never exists in pocks seated on the palm of the hand, or sole of the foot. On the base of the pock, and, consequently, on that base of the cutis, the orifice of the gland can be seen. The portion of the surface of the cutis, not covered with pocks, is in a morbid state. The vessels at the base of the pock exhibit marks of inflammation; those at its circumference, congestion. The cutaneous glands are usually swollen; the mucous membranes often exhibit inflammation, with the formation of vesicles and ulcers. Vesicles and superficial excoriations are found on the tongue. The glands on the pharynx and back part of the mouth are much dis-

tended, and have very wide orifices. There is softening of the epithelium of the esophagus, rising into pustules, and, at a later period, it is entirely destroyed. Ulcers occur in the esophagus, the mucous membrane of the nasal fossæ, larynx and trachea. In the latter, vesicles often form. On the pharynx, back part of the mouth, stomach and intestinal canal, pocks are never found; but there is often destruction of the papillæ of the mucous membrane, particularly of the small intestine. The mucous membrane of the genital organs is free from pocks, excepting at its junction with the external skin. In a few cases, an eruption was found on the serous coverings of the spleen and liver.

Prognosis.—In distinct small-pox, occurring in patients of good habits, the prognosis is generally favorable. In the confluent form, however, the danger is always considerable. A favorable prognostic is a regular course of the disease, without serious inflammatory or malignant complications. The signs which may be looked upon as especially unfavorable, are excessive lumbar pains, the continuance of vomiting after the eruption appears, violent delirium, coma or convulsions, in the first stage, great abundance and confluence of the eruption, a want of redness about the pock, a livid or purplish color of the pustule, sudden disappearance of the swelling of the face and salivation, and the absence of swelling in the hands and feet when the eruption is copious, great hoarseness, difficult respiration, hemorrhages, suppression of urine, involuntary discharges, etc., etc.

The disease is more fatal in children and in advanced life, than in the intermediate stages. Plethora and debility are both unfavorable symptoms. The disease is always dangerous in pregnancy, and abortion not unfrequently occurs. Patients may die at any period, from the time of invasion to the end of the fifth or sixth week. From Dr. Gregory's observations, it appears that the greatest number die on the eighth day.

Treatment.—Heretofore, the treatment of small-pox has not only been comparatively unsuccessful, but much diversity of opinion existed as to the course to be pursued. As we have already stated, small-pox is produced by a specific poison, introduced into the system, and circulating with the blood. It is this *materies morbi* that nature attempts to eliminate through the skin, and other emunctories of the body. To assist her efforts, we should give an active

purge of podophyllin and anti-bilious physic, followed by a thorough spirit sweat. This can be done by placing the patient on a Windsor chair, with two blankets, one applied in front, and the other to the back, a cupful of alcohol placed under the chair, and set on fire, and allowed to burn until free perspiration is produced. After the sweat, the patient should be thoroughly sponged, wiped, and placed in bed, and thirty grains of triturated macrotin added to a tumbler half full of water, and one teaspoonful given every half hour, or hour. If there is fever, aconite or veratrum should be given. If inflammation of the fauces should prove a troublesome symptom, a mild solution of the chlorate of potash and hydrastis should be used as a gargle. In some cases, when the angina is very severe, in addition to the gargle, I have found hot packs, applied to the throat, of much benefit; and when the disease assumes a confluent and an erysipelatous character, quinine and muriated tincture of iron are valuable remedies. A prescription that I have been in the habit of using, is the following:—Take muriatic tincture ferri, one dram; quinæ sulphas, ten grains; syrup simplex, three ounces. Mix. Dose,—One teaspoonful every two hours.

During the entire progress of the disease, the body should be thoroughly sponged once a day, and wiped dry; afterwards, the following application should be made to all portions of the surface where there are pustules or symptoms of inflammation:—Take creasote, thirty drops; olive oil, one pint. Mix, and anoint the surface after each bathing. If the pustules, at any period, should present a disk appearance, and there should be symptoms of fever, a liberal amount of beef broth, wine whey, and, in some cases, quinine, iron, and hydrastin, should be freely administered. These symptoms are more liable to occur from the seventh to the tenth day, and have, usually, been described under the head of secondary fever. In cases where there appears to be a large amount of the small-pox virus absorbed, I have found much benefit from the free use of diuretics, such as barosmin, chimaphilin, &c. To prevent pitting, iodide of collodion should be applied to all portions of the face, and re-applied as often as every twenty-four hours. The iodide of collodion may be made by adding ten grains of iodine to four ounces of collodion. Small-pox is frequently complicated with local inflammation, such as pneumonia, pleuritis, gastritis,

hepatitis, &c. When these complications occur, they should receive a special treatment, as described under their respective heads. During the convalescence, the system should be well supported by means of a nutritious diet; and, in weak and debilitated cases, by a liberal amount of milk punch, malt liquors, &c.

In some cases of small-pox, ophthalmia manifests itself as an obstinate and dangerous symptom. In such cases, I have found the greatest benefit resulting from the application of ten grains of hydrastin, triturated in two ounces of glycerine, and applied to the eyes in the form of an ointment. In cases where the mucous membrane is granulated, small doses of rhusin, repeated at proper intervals, will be found a valuable remedy. If there is bronchial irritation, with cough, from one-half to one teaspoonful of the acetic syrup of sanguinaria, repeated at proper intervals, will afford relief If there is a vitiated condition of the system, one ounce of tonic tea and two drams of carbonate of iron, should be added to one quart of port wine, and a wine-glassful administered three or four times a day. This remedy not only supports the system and strengthens the blood, but aids in the elimination of the poison. Where the pustules occur on the back portion of the fauces, they may be cauterized with nitrate of silver; one or two applications will usually destroy them. The same application should be made when the pustules occur on the cornea. If the stomach is vitiated, either at the commencement or during the progress of the disease, a thorough lobelia emetic, followed by large draughts of ginger tea, will prove of the greatest service.

VACCINA.

Vaccina, or Cow-Pox, is a variety of exanthematous disease communicated by inoculation or vaccination, and characterized by the existence of one or more umbilicated vesicles upon the skin, serving materially to destroy the susceptibility of the system to the contagion of small-pox in the majority of cases, and in those in which it does not offer complete protection, rendering them mild and free from danger. The origin of the disease is not quite certain. It has been supposed to have originated in the horse, and communicated to the cow, and from the latter to man.

But it is more probable that it results from the variolous disease communicated from man to the cow, and producing in it a modified form of the affection, which in man is very destructive. It having once occurred in the cow, may be transferred to human beings by the application of the virus to a slight wound of the skin. The operation for its communication is vaccination, for the employment of which, as a preventive to small-pox, the world is indebted to Dr. Jenner, who, after a series of observations and experiments which had occupied his attention for twenty years, promulgated the discovery in 1798. This practice of vaccination met with much hostility at first; but the discoverer lived to see it triumph over all opposition, and to witness its beneficent results. In 1799, it was introduced into this country by Benjamin Waterhouse, of Boston, the first professor of medicine in Harvard College.

Symptoms.—The symptoms in the cow are very slight, producing some febrile excitement, and on the third or fourth day minute pocks appear upon the teats, and sometimes on the eyes and nose, which enlarge gradually, assuming the umbilicated appearance, and arriving at their height, begin to desiccate on the eleventh or twelfth day after their first occurrence.

To produce the disease in man, matter should be taken from the pustule on the teat of the cow, or from a healthy child, in which the virus has previously been inserted. Very soon after the matter has been introduced, a little inflammation arising from the puncture may be seen at the spot; but this disappears, and nothing is left but a slight trace of the incision. On the third day after vaccination, the operation being generally performed on the arm, near the insertion of the deltoid muscle, small papulæ are visible, which, on the following day, are more developed and reddened. On the fifth day vesicles are observable, which are umbilicated at the top, and contain a colorless, transparent, and viscid fluid, called the vaccine lymph. On the seventh day, the vesicles are tolerably well formed, presenting a shining appearance, and on the eighth, a red areola is visible, extending from two to three inches around the pocks, increasing in redness until the ninth or tenth day, at which time the pustule is perfected, being elevated from two to three lines, measuring one-third of an inch in diameter, slightly umbilicated, and having a small brown scab in the centre.

About the fourth day after vaccination there may be some febrile excitement: and when the pustules are perfect, there are often pain, pruritus, restlessness, swelling of the lymphatic glands of the arms, and enlargement and tenderness of those of the axilla. On the tenth or eleventh day the febrile movement subsides, and the areola becomes faded. A dark spot soon appears on the centre, and gradually extends over the whole of the pocks. The pustules desiccate: and by the fifteenth day nothing remains of the pocks, except black, hard scabs, which fall off generally during the third or fourth week, leaving an oval scar.

While this is the general course of vaccina, it is liable to great diversity, the symptoms being much more severe in some cases. Sometimes there is no perceptible fever, little irritability or pain during the stage of suppuration; while in others, along with considerable fever, the local affection is very severe, the areola extending over nearly the whole arm, or even beyond it, with much swelling and pain, assuming almost the form of erysipelas.

If the vaccine matter be inserted at different points, so that the areolæ of the pocks run into each other, the most violent inflammation and gangrene may ensue. The virus should never be inserted in more than at one place at a time, unless it be done so closely that only one pock will form. Vaccination may be performed at almost any age, after the second or third month of infancy, and should always be attended to in early childhood, and repeated every six or seven years, or on the appearance of any epidemic. Females should never be vaccinated in pregnancy, excepting where the exposure to variola is endangering life.

Diagnosis.—To distinguish vaccina from the spurious affections which sometimes result from vaccination, is of the greatest importance. No pustule should be pronounced genuine, unless it has an incubation of from two to four days; then a pimple, which passes on to a vesicle by the sixth day, having an umbilicated appearance, and all the other essential points which I have enumerated. The inflammation in the spurious sores, commences earlier than in the genuine. They progress more rapidly, are irregular in shape, lack the central depression, scab early, are apt to bleed on a slight injury, and the vesicles are fragile, breaking easily, and leaving a soft, yellowish crust.

Anatomical Characters.—When the vaccine vesicle is dissected upon the ninth day, there may be noticed a small portion of pus at the umbilicated depression in the centre, beneath a scale of the cuticle. When this is removed, the whole vesicle has a shining appearance, and upon being opened, is found to contain a colorless, viscid, and inodorous limpid fluid, in small cells, arranged concentrically in two rows, and formed in a pseudo-membranous product, which has been thrown out between the cutis vera and the epidermis.

The *prognosis* is always favorable, excepting when violent inflammation and gangrene occur in the arm, which need not ensue, if the vaccine matter be inserted at only one point at a time.

Method of Vaccination and Treatment.—The best period is when the child is from three to six months old. This should be accomplished by selecting a pure lymph from a cow-pox pustule, on a healthy person, when the pox is about four or five days old. Then take a sharp lancet, and make frequent scarifications through the cuticle, and allow the arm to be exposed until all the blood that will flows from the superficial capillaries; then wipe the scarified portion with a soft sponge or cloth, and apply the lymph by means of the point of the lancet. If the pure lymph from the udder of the cow can be obtained, all the better. All the after-treatment that is necessary, is to notice the symptoms; and if there be fever, give a few doses of aconite, a warm bath, or such other remedies as the case may indicate.

The importance of vaccination should be fully impressed upon the attention of those who have children in charge; and in case that this almost positive use of preventing the disease has not been resorted to before the adult age, it should be then. The only important thing to be attended to, is to see that the virus is of a pure character, free from scrofula, syphilis, and other infectious and contaminating diseases.

VARICELLA.

Varicella or chicken-pox, is a very mild exanthematous disease, characterized by a slight fever, of short duration, and followed by vesicles, which desquamate and desiccate on the fifth or sixth day.

Symptoms.—The febrile symptoms are sometimes ushered in by slight rigors, although, usually, they appear without any noticeable

chill. There is often headache, and occasionally vomiting. After the febrile state has continued from a few hours to one or two days, the eruption appears, usually presenting itself first upon the breast, shoulders and back, and then gradually spreading over the scalp, face and extremities; the face being much less affected, materially, than in variola. The pocks are usually scanty, though sometimes they are numerous. They appear first as red spots, which quickly become vesicular, are irregular in shape, and vary in size from the head of a pin to that of a split pea. The eruption is frequently attended with itching or tingling. On the third or fourth day the vesicles burst, or are broken by scratching or rubbing, and on the fifth the fluid in those which remain entire, acquires a straw-colored appearance, and gradually dries, leaving small brown crusts, which harden and fall off in scales by the eighth or ninth day, leaving the surface slightly discolored, but not depressed. Sometimes they occur in successive crops for two or three days, so that when some are just appearing, others are in a state of maturity, and others still have dried, and are falling away. The last crop is generally a day or two later in reaching maturity, and separating. If there has been much scratching or rubbing, the vesicles become pustular, and may leave pits.

Chicken-pox is contagious, as regards children. It is never produced by inoculation. A peculiar contagion is generally the exciting cause, although it may be strongly favored, and, perhaps, originated by an epidemic influence. One attack protects the system against a second. The period of incubation varies from twelve to seventeen days. The variety in which the vesicles are about the size of split peas, and flattened at the top, has been distinguished as *varicella lentiformes; varicella coniformis vel conoides*, when characterized by the conoidal form, and *varicella globularis*, when they are unusually large and globular in form. This latter variety has often been styled "the hives." This division is of not much importance, as not unfrequently all these varieties appear in the different vesicles of one case.

Varicella was, for a long time, confounded with variola, and is, even at the present time, considered by some eminent teachers and writers as a modified form of the latter. But the following facts are, I think, conclusive against the non-identity of the two affections.

Varicella often appears in neighborhoods where there is no variola; and epidemics of the former sometimes occur without a case of the latter. Varioloid prevails only during the occurrence of variola. Varicella is very rarely communicated to adults, and affords no protection against variola or vaccination. The whole course of its symptoms is different. The fever is more severe, and continues longer in variola, and the eruption assumes the vesicular character much later; is often umbilicated or more or less pustular, and there is greater elevation and hardening of the vesicles.

Treatment.—In an ordinary case of varicella, very little treatment is required; but where there are constitutional indications of a feeble vitality, the disease may assume a very severe character. In such cases, the stomach and bowels should be well cleansed, the surface sponged in hot soda water, and small doses of aconite administered to control the fever. If the eruption is of a fugitive character, macrotin and iron should be given to maintain it upon the surface. If there is much irritation of the surface, equal parts of aqua calcis and oleum olivæ should be applied. In some cases, tonics, iron, and cod-liver oil will be required to support the system during convalescence.

ERYSIPELAS.

Erysipelas is an exanthematous febrile affection, characterized by a peculiar diffused erythema, or inflammation of the derma. Before considering this disease, it is well for us to remember the peculiar structure of the skin, that the mucous membranes are only a continuation of the derma, lining internal cavities, and lubricating their surfaces by the secretion of mucus, while the skin exhales the perspirable matter. Erysipelas consists of three varieties, the simple, the phlegmonous, and malignant.

Symptoms.—Simple erysipelas commences with languor, aching, or soreness of the limbs, chilliness, or rigors, alternating, with flushes of heat. These are followed by a frequent pulse, hot skin, a foul tongue, anorexia, thirst, sometimes nausea, vomiting, headache, restlessness, sore throat, swelling and tenderness of the lymphatic glands of the neck, axilla, or groin, according to the seat of the cutaneous inflammation. If the cervical glands are swollen, the erythema will probably appear on the face or scalp; if the

axillary, on the arms or hands; if the groin, on the lower extremities; and if there is a general soreness of all the lymphatic glands, it extends over the surface of the body.

On the second or third day of the fever, the erysipelatous inflammation makes its appearance in the form of a small, reddish spot, usually somewhat elevated, painful and tender to the touch. This occurs most frequently upon the face, especially upon the side of the nose, the cheek, or the rim of the ear. The redness disappears upon making pressure, but quickly returns when it is removed. The inflammation, in some instances, advances slowly, and is confined within narrow limits; in others, it spreads quickly over large portions of the body. Generally, its course is continuous; but now and then instances occur in which it attacks separate parts of the body in succession. In the face, it has a tendency, usually, to spread upward to the scalp, and not unfrequently extends over the whole head, and even down to the neck.

There is a burning or stinging pain and tumefaction, from the commencement, which increases, more or less, during the progress of the disease. About the third day of the inflammation, small blisters, or vesicles, appear, filled with a yellowish serum, which break and discharge a viscid fluid, about three days afterwards. On the fifth or sixth day they begin to dry, and on the seventh or eighth, form crusts or scabs, which desquamate, and a new cuticle forms.

Phlegmonous Erysipelas.—In this variety, not only is the skin inflamed, but there is, in addition, more or less inflammation of the subcutaneous tissues; the fever is also more violent, the pain much more severe, and the swelling greater than in the simple form. The disease may progress, decline and terminate in a few days; but sometimes the swelling does not disappear in proportion with the fever and pain, and abscesses form between the muscles, and, in severe cases, may involve the cellular tissue and destroy the adjacent parts.

Malignant Erysipelas.—Malignant erysipelas is, usually, ushered in by a severe chill, which is soon followed by a re-action and a high grade of fever. There is a quick, bounding pulse, a heavy beating of the carotids, intense thirst, violent headache, constipation of the bowels, and high-colored and scanty urine. Usually,

preceding the chill, there is an inflammation upon some portion of the body, mostly upon the face, which commences in a small vesicle, and rapidly extends to the adjacent tissues, producing great swelling, and pain, of an itching, smarting, or burning character. The part soon assumes a deep, purple hue, and the constitutional symptoms are much aggravated. The inflammation may extend to the lymphatics, about the neck, and produce so much œdema as to impede the circulation of the blood to the brain, and interfere with respiration. It not unfrequently attacks the mucous surface of the mouth, and upper air passages, producing asphyxia, and rendering deglutition impossible. The fever is, usually, of a typhous character, and is soon followed by great prostration; the tongue is loaded with a dark brown coat; sordes accumulate upon the gums and teeth; there is great wakefulness at first, and not unfrequently delirium. In the early stage, the delirium is mostly of a violent character; but as the disease advances, there is a strong tendency to exhaustion, typhomania, and coma. In some of the most violent forms, gangrene, or mortification, seizes the parts almost immediately upon the advance of the inflammation. In other cases, the exudation is transformed into pus corpuscles, and large abscesses form in the subcellular tissue. The disease is of a most fatal character.

There is still another form, which occurs in infants soon after birth, which, by some writers, is considered a distinct variety, with the title of erysipelas neonatorum. The child may be born with the disease. The invasion is always extremely insidious. The child appears somewhat morose, his sleep is slightly disturbed, he suckles less; and with these symptoms there is associated a small patch of redness upon the pubes, which is painful upon pressure. The redness gradually spreads over the trunk and abdomen to the genitals, nates and lower extremities. It may, also, appear first upon the face or limbs. It is much disposed to suppuration and gangrene. The color of the skin and the expression of the countenance, do not exhibit any striking change at first, but suddenly an ashy, cadaverous paleness is noticed, the child cries incessantly, there is constant jactitation and complete loss of sleep. Convulsions, vomiting and diarrhœa seldom occur. Sometimes the disease is associated with peritonitis. The duration varies considerably;

sometimes being extremely short, while again it may be prolonged to a week.

Causes.—The disease has been ascribed to cold, stimulating food and drink, violent mental emotion, excessive fatigue, and suppression of the menstrual or hemorrhoidal discharge. It may, also, be excited by any undue irritation of the skin, as from the direct heat of the sun, burns, blisters, wounds, bites or stings of insects, etc. But none of these causes are capable of producing erysipelas; there must be something which predisposes the individual to this particular affection, rather than to others. Some persons are, constitutionally, predisposed, in whom the attacks are periodical. The intemperate are more liable to the disease than the temperate. Influences which tend to depress or debilitate the system, even without producing disease, have the same effects. But there is also some unknown condition of the atmosphere which favors the occurrence of erysipelas; that where it exists, the slightest causes will give rise to it, though, at other times, they may have no such effect. It is frequently so strong, that the slightest irritation induces an attack. Wounds about the head are peculiarly liable to erysipelatous inflammation.

From observations in the existence of this disease, as well as its amenability to certain forms of treatment, it is evident that the real cause of erysipelas is of a malarial character. That vegetable malaria will produce erysipelatous inflammation, we have the most positive evidence. In 1846, there was an epidemic of this disease, of the most extensive and fatal character, in the vicinity of a heavy marsh in the southern part of Ohio. It was of the malignant form, manifesting itself in the commencement by a severe chill, violent re-action, extensive nervous prostration, vesicular inflammation about the face, which rapidly terminated in gangrene and mortification. This disease extended along all the malarial portions of the State, and was not successfully treated until active stimulants and antiperiodics were used. In some cases, violent congestive ague manifested itself for many days previously to the outcropping of the inflammatory action; while, in others, after controlling the erysipelatous inflammation, it was by no means uncommon for the disease to be perpetuated for weeks, and even months, in the form of chronic ague. So frequently is this disease associated with

marsh fevers, that we apprehend there are few intelligent practitioners, in malarial districts, who could not bear testimony to its miasmatic origin. Animal malaria may, and probably does, produce a dyscrasia of the blood, that contributes to one form of this disease. This may produce that variety which is so frequently met with by the surgeon in hospitals.

Diagnosis.—The diagnosis may be difficult in the initial fever, before the cutaneous eruption appears; but whenever a patient has exhibited for one or two days an intense febrile movement, attended with pain, swelling, and tenderness of the lymphatic glands of the neck, we need not hesitate in announcing that it is the commencement of an erysipelatous attack. After the eruption has occurred, the only disease in relation to which there can be any difficulty is erythema; and from this erysipelas may be designated by the greater swelling and hardness, the well-defined boundary, and the continuity of the eruption.

Anatomical Characters.—The blood is found, after death, changed, or in a dissolved state, the skin has a brownish tinge, the redness having disappeared. Small veins have sometimes presented a red appearance on their inner surface, filled with pus. Pus is frequently found in small abscesses, or diffused extensively in the cellular tissue, and among the muscles. Sometimes small quantities are observed in the lungs and liver. When death results from coma, serous effusion may be observed under the arachnoid and in the ventricles, and the veins of the pia mater are distended. When incidental inflammations have supervened during the progress of the disease, these ordinary effects are observed.

Prognosis.—The prognosis in the simple form is usually favorable, unless there is inflammation of some internal tissue or organ. In erysipelas of the face, the chief danger arises from the brain becoming involved, which is very apt to occur if the eruption invade the scalp. A sudden disappearance of the eruption, with symptoms indicating internal inflammation, is unfavorable. In phlegmonous erysipelas the danger of metastasis is less than in the former variety, but the febrile excitement and disturbance of the system are generally much greater, and there is always danger of suppuration and gangrene. When the latter complication occurs, the disease is very dangerous. In malignant erysipelas the prognosis is always

unfavorable, whether it occurs accidentally, sporadically, or epidemically. In middle-aged persons, of good habits, the system may endure even this form, if the general strength be sustained. In very young children, in those in the advanced stages of life, or those of filthy or intemperate habits, the disease is usually fatal. Coma and delirium are always unfavorable. Sometimes erysipelas has been productive of good, having cured psoriasis, impetigo, and other cutaneous affections, and temporarily removed syphilis.

Treatment.—In the commencement of this disease, the system should be most thoroughly renovated by a lobelia emetic, a mild purge, and a hot soda bath. In the mild form, the inflamed patch should be covered with collodion, and the application renewed every two or three hours. The emetic and purge should be immediately followed by a full round of antiperiodics and iron. I have usually been in the habit of administering from ten to twenty grains of quinia sulphas, and one dram of ferri ferrocyanuretum, in the course of twenty-four hours. The quantity may be divided into six or eight powders. These should be followed by five or ten drops of the tincturæ ferri chloridii, every half hour or hour. If the inflammation should still incline to extend, cloths wrung from a hot decoction of equal parts of quercus alba and hydrastis canadensis, should be applied, and changed every few minutes. In mild cases, the application of a little stramonium ointment, followed by the constitutional treatment, as previously described, will suffice to control the disease. When it occurs in wounds, the topical applications should be of a highly stimulating character, in combination with antiseptics. I have witnessed some most remarkable recoveries, of erysipelatous inflammation, after surgical operations, by applying lint saturated in compound tincture of myrrh and capsicum to the part, and frequently renewing it, and at the same time administering muriatic acid, quinine, and iron, internally.

In the treatment of the malignant form, in addition to the emetic, purging, etc., a thorough alcoholic bath should be administered at the commencement of the disease, and active stimulants added to the antiperiodics. In the epidemic to which I have referred, I was in the habit of administering from two to three grains of capsicum, with one or two of sulphate of quinia every hour or two, and in many cases of a virulent character, I also gave the hot brandy toddy

between each powder. I cauterized the vesicle with nitrate of silver, and immediately covered it with collodion. This treatment not unfrequently arrested the disease at once; and in all cases where it was administered in the early stages, it was followed by prompt relief.

When the fever is violent, it should be controlled by aconite, or veratrum viride, in connection with frequent sponging of the body. If there be great determination of blood to the head and delirium, sinapisms should be applied to the feet and extremities, and ice to the head. The bowels should be kept open with citrate of magnesia, or sulphate of soda, and the kidneys stimulated by mucilaginous diuretics. When the inflammation seizes the mucous membrane of the mouth and throat, nitrate of silver, in the proportion of ten grains to an ounce of water, should be applied by means of a probang, and the mouth and throat frequently rinsed with a hot decoction of hydrastis canadensis. If there be extensive swelling about the neck, it can usually be reduced by applying cloths dipped in a hot solution of sulphate of zinc. Cupping, leeching, and scarifying, have also been resorted to with success in some cases. After this active form of treatment has been pursued for a few days, or a sufficient time to neutralize the poison in the blood, and energize the emunctories of the body, specific remedies may be administered, such as small doses of belladonna, scrophularia marilandica, and rhus radicans. It must be remembered that these remedies should be administered in small quantities, and by adding a few drops to a tumbler of water, and giving a teaspoonful every fifteen or twenty minutes. As soon as the active stage of the disease is passed, a liberal amount of nutriment should be ordered, and every possible effort made to support the strength of the patient.

MILIARIA.

Miliaria consists of an eruption of minute vesicles, not exceeding the size of a millet seed, extending in great numbers over different portions of the body. It is generally an attendant upon certain febrile diseases, although it may be idiopathic when it attacks those who have been previously weakened by fatigue, or by a long exposure to damp and malarious atmosphere, or who have been for a long time confined to a bad regimen.

Symptoms.—It mostly commences with rigors, languor, a quick pulse, hot and dry skin, and thirst. The eruption generally appears about the fifth or sixth day from the commencement of the febrile attack. Previously to its appearance, there is a sense of pricking or itching of the skin. The patient complains of great præcordial oppression, but is soon relieved by a profuse perspiration. The vesicles are so minute at first as scarcely to be seen. They gradually enlarge, are hemispherical, and assume a pearly aspect, owing to the liquid within becoming somewhat opaque and milky. Sometimes they are formed on a red base, and consequently have a reddish tinge, and constitute the *miliaria rubra* of authors; but when they appear on a comparatively pale surface, when the fluid becomes pale, opaque, white, pearly, or milky, the term *miliaria alba* has been applied to them. They are generally quite distinct, and are irregularly scattered over the body, though sometimes they are confluent, and occasionally coalesce into the form of bullæ. They are most abundant upon the neck and trunk, and rarely occur on the face. In some instances they are attended with itching or tingling. Each vesicle soon desiccates, seldom continuing longer than from two to five days, though successive crops are often produced. They are followed by a slight desquamation.

Causes.—Miliary vesicles, or sudamina, almost always occur in connection with febrile diseases, and are restricted to no form or grade, but may appear equally in the mild and malignant, the inflammatory and the typhous. Thus we meet them in typhus and typhoid fevers, in the early stages of small-pox, measles, and other eruptive fevers, in the course of puerperal fever, in acute rheumatism, phthisis, and in many of the phlegmasiæ. Copious and continued perspiration favors their production; and in whatever febrile complaint this phenomenon is presented, we may look for sudamina, though they are not invariably found. They are sometimes met in enteric and congestive fevers, when this condition has not occurred. Epidemic influences occasionally give a tendency to miliary eruption in different diseases, in connection with which they are seldom seen on other occasions. There is no reason to suppose that they are contagious. They occur more frequently in summer than winter. The disappearance of the eruption has little or no influence upon the course of the disease, of which it is the symp-

tom; but as it is caused generally by the application of cold, by improper food and regimen, mental emotions, and other powerful agents, the consequent ill effects are to be attributed to these principally.

Diagnosis.—The diagnosis of miliaria is easy, and the only eruption with which it can be confounded is eczema, and there is usually little difficulty in distinguishing them. In eczema the vesicles are more apt to appear in patches, there is much more itching and irritation, the duration of the eruption is longer, and it is not likely to occur as an attendant on severe fevers.

Prognosis.—The miliary eruption, in itself, is quite unimportant, indicating only a state of increased action, with determination to the skin, but sometimes it is useful as a diagnostic sign in enteric and typhus fevers. Its sudden retrocession is not accompanied with danger.

Treatment.—The treatment of miliaria consists in removing the cause and febrile symptoms which accompany the disease. A hot bath, and a few doses of aconite, will suffice to remove the fever and irritation; while quinine and iron should be given when the disease is produced by malaria. If the stomach and bowels be in a vitiated condition, they should be attended to; and if there be persistent irritation and eruption, macrotin, belladonna, and scrophularia, are the remedies. If the system be in a debilitated condition, tonics, baths, and a generous diet, will usually remove the disease. When irritating vesicles occur, resulting in abrasions of the skin, a wash of oxide of zinc, of the strength of one dram to four ounces of water, followed by lime water and sweet oil, or stramonium ointment, will soon relieve the difficulty.

Miliaria may be produced by the presence of parasites in the alimentary canal, and in such cases, santonin, podophyllin, and leptandrin, should be given. When a symptom of other diseases, it will subside by removing the affection upon which it is dependent.

URTICARIA, OR NETTLE-RASH.

Urticaria, or Nettle-Rash, is a non-contagious disease, characterized by circular elevations of the cuticle, which are usually surrounded by a diffused redness, with a white spot in the centre, and are attended with itching, tingling, or other disagreeable sensations.

These elevations, or wheals, are little swellings of the skin, of irregular outline, but usually roundish or oblong, are more or less hard, generally whiter, but sometimes redder than the healthy skin, containing no liquid, and having no tendency to suppuration. An example is offered of them in the small elevations produced by the stinging of nettles; hence its trivial name, nettle-rash. Similar appearances follow almost immediately upon a smart blow with a cane, or with the lash of a whip on the skin. There are two varieties of urticaria, the acute and chronic. The former is attended with some fever, which sometimes begins two or three days, but commonly not more than a few hours before the eruption appears, and is complicated frequently with signs of gastric and nervous disorder, such as headache, nausea, and vomiting, pain in the epigastrium, anxiety, languor, faintness, and slight rigors. These symptoms usually disappear upon the appearance of the rash.

The eruption may appear in any part of the body, but generally is most abundant upon the inside of the forearm, and about the shoulders, loins, and thighs. It often attacks the face, and has appeared on the inside of the mouth. It comes and goes regularly, often declining in the day, and returning in the evening, being accompanied with intolerable itching and pricking sensations, especially when the patient undresses and gets into bed, or when it is exposed to the air. The eruption lasts sometimes only a few minutes, again for several hours, and on disappearing in one place, often returns in another. In some cases, it coalesces, causing great tumefaction, tension, and irregular hardness of the skin, and almost universal redness. The attacks usually continue a week or ten days, and at their close a slight desquamation of the cuticle commonly occurs. Sometimes the eruption appears with previous fever, especially when the disease proceeds from a disordered stomach. In such cases, about an hour or two after the substance has been swallowed, there are pain and uneasiness in the epigastrium, nausea, vertigo, anxiety, etc., which are soon followed by the eruption. Sometimes the whole surface of the body is very much swollen, with an almost continuous erythematous redness, interrupted here and there by single or clustered wheals, and the patient suffers occasionally from oppressed breathing, which almost threatens suffocation, in connection with the other symptoms. After this violence

has continued for a few hours, the disease gradually subsides, and terminates generally in one or two days. The symptoms usually disappear very rapidly, after the stomach has been evacuated by emetics, or other agents. Sometimes urticaria assumes an intermittent form, occurring in regular paroxysms every one or two days.

In the *chronic* form, there is no fever, and the eruption is not persistent, but appears and disappears irregularly. The wheals are usually whitish, and less apt to be surrounded by a redness. The patient is annoyed with the itching and stinging sensations, and often suffers more or less with gastric and nervous symptoms. In those who are subject to it, the itching and wheals are readily produced by scratching or rubbing the surface. Evening is one of its favorite periods. The duration is very uncertain and variable, sometimes extending to weeks and months, or even years. Occasionally the wheals attain a considerable size, forming tumors in the loins or limbs, which are hot, painful, and tender, occurring usually at night, and subsiding in a few hours, and leaving sensations of fatigue, or of a bruise. In other cases, they continue for two or three weeks after the disappearance of the red efflorescence, retaining their characteristic sensations more or less.

Causes.—The most frequent causes are internal irritations, particularly of the stomach and bowels. It often attends dentition, and the bowel complaints of children. Acid and other irritants produce it. Certain kinds of food are sometimes the cause of nettle-rash. Of these, lobsters, crabs, shrimps, and especially muscles of different kinds, are the most apt to produce it. Pork, salt and smoked fish, mushrooms, almonds, honey, oatmeal, raw cucumbers, strawberries, and raspberries, may excite the disorder in some persons. Some medicines have occasionally produced the same effect, as valerian, copaiba, pipsissewa, and the turpentines. It has been produced by drinking porter.

Over-exercise, strong mental excitement, indulgence in rich food, and intemperance, sometimes produce attacks of urticaria. It is more common in summer, though it is considered by some authors as caused by exposure to cold more frequently than to heat. Peculiar delicacy of skin predisposes to the disease. It is sometimes an attendant upon other complaints, especially fevers and febrile

affections. It is said to have appeared epidemically. It occurs in all ages, but is most common in infants, in sanguine temperaments, and attacks women more frequently than men.

Diagnosis.—Urticaria is sometimes mingled with other eruptive affections, such as lichen, roseola, erythema, and impetigo, and it may be rather difficult to distinguish the prominent disease. The peculiar sensations and the wheals are usually sufficiently characteristic. Lichen urticatus might be confounded with it, as these phenomena occur in it; but the tumors in the former are less prominent, smaller, firmer, of a deeper color, and much more persistent, and are less attended with true papillæ.

Urticaria, though a very disagreeable and annoying disease, is very rarely dangerous. Sometimes death has occurred from substances taken into the stomach; but it would be difficult to decide how far it depended on nettle-rash alone, and on gastric inflammation, or other internal disturbances produced by the same cause.

Treatment.—When the disease is ushered in by febrile excitement, the bowels should be moved by means of a mild purge, the skin bathed with warm soda water, and when it is caused by vitiated ingesta, a mild lobelia emetic may be administered. If there be still constitutional disturbances, the fever should be controlled by giving from ten to fifteen drops of the tincture of corollorrhiza odontorrhiza every two or three hours; and if the eruption should prove irritating, the parts may be bathed in equal quantities of aqua calcis and oleum olivæ, and where the disorder disappears, and irritation of the mucous membrane follows, as is frequently the case in metastasis, two or three drops of the tincture of scrophularia marilandica should be given every half hour, or more frequently, if the disease be not transferred to the derma. Where the disease is perpetuated by some *materies morbi* in the blood, one dram of iodide of ammonia added to six ounces of water, and a teaspoonful administered every two or three hours, will frequently prove successful: if it be caused by vegetable malaria, quinine and iron are the remedies. Chronic urticaria is frequently the result of improper diet, such as hot cakes, strong coffee, highly seasoned food, &c. This form is usually cured by regulating the diet, and an occasional purge. In addition, the disease is frequently the result of vitiated breast milk: in this case, where the secretions from the mammæ

cannot be corrected, the child should be weaned. Bathing, fresh air, and out-door exercise, also have a beneficial influence in this disease.

ROSEOLA.

Roscola, or *Rose-Rash*, sometimes called *false measles*, is an eruptive fever, of little importance. It commences with slight febrile symptoms, attended with more or less gastric derangement, which continues two or three days before the rash appears, and subsides along with it. The eruption commences generally upon the face, neck, and breast, with specks or small patches, which sometimes remain distinct, but more frequently are confluent, and occasionally large portions of the body are covered with an almost uniform redness. There are itching and tingling. The fauces are often reddened, and the papillæ of the tongue appear through a slight coating of fur. The throat is sometimes sore. The rash may continue for a day or two, or to the fourth or even fifth, before it entirely disappears. It gradually fades, and is followed by slight desquamation of the cuticle. The appearance of the efflorescence differs considerably. In many cases, it resembles measles, in its distinct, somewhat regular, slightly elevated patches, which vary in size from a mere speck to an inch in diameter. Occasionally they appear in a circular form, with sound skin in the centre. Frequently the rash appears and disappears, and by this alternation may continue for a week before leaving entirely. When it recedes suddenly, there are occasionally disordered stomach, headache, giddiness, faintness, pains in the limbs, and melancholy, which symptoms are relieved by its return. Sometimes these symptoms precede the appearance of the eruption.

Roseola may assume a *chronic* form, the efflorescence coming and going at different intervals, or fading in the morning and returning towards night, but such instances are rare. The disease is never contagious, and one attack does not secure against a succeeding one.

Causes.—Roseola originates in a great diversity of causes. It often accompanies dentition. The sudden check of perspiration, the drinking of cold water while over-heated, and the vicissitudes of heat and cold in summer sometimes produce it. It frequently arises from gastric and intestinal irritation. Copaiba, and the free use of

dandelion, have produced a similar rash. It is not uncommon in variola and varioloid, and is occasionally observed in vaccina. Roseola sometimes attends typhoid fever, rheumatism, gout, and cholera. Sometimes it appears epidemically, and is most frequent during the prevalence of scarlatina and rubeola.

Diagnosis.—Roseola is sometimes mistaken for scarlatina and measles. In many cases in which these diseases are said to have occurred more than once in the same individual, roseola was mistaken for them. The latter is not a contagious disease, while the two former are. Scarlet fever is attended with sore throat, measles with catarrh; but roseola is not associated with either. The fever and constitutional disturbance are much less in the latter than in the former. The eruption is brighter; and while the patches are more regular than in scarlatina, they are less than in rubeola. Notwithstanding, it is often difficult to discriminate between mild cases of scarlatina and roseola, especially when sore throat is an attendant upon the latter; and if it should be connected with catarrh in rubeola, there is the same obstacle in distinguishing it from measles. A correct diagnosis can only be drawn from a general survey of its cause, course, and effects, after the doubtful symptom has subsided.

Roseola is a comparatively trifling disease, and need not cause any anxiety.

Treatment.—The treatment of rose-rash is usually of a very simple character. Generally, but little more is necessary than a warm bath, and a few drops of the tincture of aconite. Where the irritation is troublesome, and the disease of a chronic character, I have been in the habit of adding ten or fifteen drops of the tincture of rhus radicans to a tumbler of water, and giving a teaspoonful every half hour or hour. If the eruption should prove troublesome, two or three drops of the tincture of belladonna should be added to a tumbler of water, and a teaspoonful given occasionally. Small doses of neutralizing mixture may also be required in cases where there is an irritable condition of the stomach and bowels.

ERYTHEMA.

Erythema consists in an eruption of a superficial redness, generally in irregular patches, slightly elevated, and attended with heat, tingling, and sometimes slight pain. It may or may not be con-

nected with constitutional disturbance. When strictly local, it is caused by some direct source of irritation, as continued pressure upon the body, contact with acid excretions or secretions, and the application of rubefacient substances. When it is caused by the friction of contiguous surfaces, it is styled *intertrigo*. This occurs in the groin and axilla, in very obese adults after exercise, in fat infants, particularly when not frequently washed, and in the cleft of the nates, beneath the mammæ. A thin, viscid fluid of a disagreeable odor is exuded, and not unfrequently the irritated portions excoriate, with much itching, heat, and other unpleasant symptoms. Local erythema often results from dropsical distention of the lower extremities, consisting of smooth, shining, uniform patches, more or less confluent. (Erythema læve.)

When it arises from constitutional disturbance, it usually appears on the face, breast, or limbs, although it may occur in any other part. It consists, generally, of irregular, circumscribed patches, usually more or less confluent, and sometimes almost continuous over an extensive surface. There is seldom any burning or severe pain, but it is always accompanied with a sense of heat and tingling. There are usually little or no elevations of skin; although in one variety, there are often hard eminences of considerable size, which are sometimes quite painful. There may be œdematous swelling of the neighboring areolar tissue. The affection is sometimes preceded or accompanied with depression of spirits, pains in the limbs, debility, and nervous symptoms; and if it retrocede suddenly, may produce severe internal derangements. It is irregular in its duration, continuing generally for a week, but sometimes lasting only two or three days. It seldom assumes a chronic form. It is often connected with intermittent fever, and may, independently of this disease, assume a distinctly intermittent type. It generally leaves more or less desquamation upon retiring; and should the scalp have been affected, the hair falls out. It often appears as the effect of some specific poison in the blood, as mercury, lead, antimony, etc. It may occur during the progress of fevers, dysentery, and diarrhœa, and is often presented in cases of variola. It may be produced by exposure to harsh winds, hot sun, vascular plethora, irritating ingesta, very warm spices, disorder of the stomach and bowels, and sometimes has some connection with deranged menstruation. It occurs in both sexes, and is not confined to any age.

Diagnosis.—The diseases with which erythema is liable to be confounded, are erysipelas and roseola. The superficial redness, the absence of tumefaction and vesication, its occurrence in more or less circumscribed patches, the much less constant burning and pain, the less elevation, and the slight constitutional disorder, sufficiently distinguish it from erysipelas. Roseola differs from it in being of a brighter rose color, the arrangement of the rash, which is often pointed, and is not so much in contiguous patches, and by the more frequent febrile symptoms.

Treatment.—The treatment for erythema consists in removing the cause, when it can be accomplished, and the application of a little lime water and sweet oil to the parts. When it occurs in the axilla and groins, the result of friction and chafing, bathing with a strong decoction of hydrastis canadensis. If this should fail, glycerine may be applied, and the parts bathed in diluted muriatic tincture of iron, in the proportion of one dram to six ounces of water. Baths, mild purges, and occasionally quinine and iron, will be required to overcome the disorder.

GLANDERS.

The disease known as Glanders, or Equinia, in the human subject, is a malignant, exanthematous, febrile affection, which is both contagious and infectious, and is contracted from a specific poison received from glandered horses, produced either by inoculation, or by a small portion of the virus coming in contact with the nose, mouth, etc. It is characterized by a muco-purulent, and sometimes bloody discharge from the nostrils, a peculiar pustular eruption, and by tumors occurring in different parts of the body, of a purulent, bloody, or gangrenous character.

This disease has been recognized in the horse, from the time of Hippocrates. It is a loathsome and incurable affection, beginning in this animal with a contagious, constantly flowing, aqueous discharge from the nostril, usually the left one. In the second stage, it becomes viscid and glutinous, then purulent, and the neighboring glands enlarge, ulcerated spots occur on the membrane covering the cartilage of the nose, and the animal loses flesh and strength, his appetite fails, has more or less cough, and his hair falls out. As the disease advances, the ulcers grow larger, the discharge is bloody

and offensive, the membrane lining the frontal sinuses ulcerates, more of the absorbents are involved, the forehead is tender, the conjunctivæ swell and suppurate, little tumors appear on the face, and soon ulcerate, and now the lymphatic system commences to suffer. The progress is rapid, the hind legs swell, the discharge increases in quantity and fetidity, and the poor beast presents a mass of putrefaction, and at length dies perfectly exhausted.

In *man*, the disease is of rare occurrence, and the symptoms which manifest themselves may assume an acute or chronic form. *Acute* glanders generally commences with the ordinary premonitory symptoms of exanthematous fevers, such as depression, weariness, languor, pains in the limbs and back, rigors, chills, headache, a frequent pulse, a hot, dry skin, intense thirst, a coated tongue, and sometimes nausea and vomiting. About one week after the exposure, there are rheumatic and neuralgic pains in the limbs, and sometimes darting through different parts of the body. Portions of skin over the seat of these pains may become swollen, red, and present an erysipelatous character, turning of a darkish color, and containing vesicles, or terminating in patches of a gangrenous form. In the course of four or five days, an eruption of phlyzacious pustules makes its appearance on different parts of the body, usually most abundant on the face and limbs. These pustules are about the size of the vaccine vesicle, being sometimes umbilicated, having a red areola, and presenting occasionally a dark-purple hue. Along with this eruption are gangrenous bullæ, and small, shining tumors, which are at first hard and painful, and soon turn brown, and may break, and discharge an acrid, thin, serous fluid, or they may mortify, and form abscesses in the intermuscular structures. The pustules usually appear in successive crops; and in some cases, instead of going through the ordinary course, they degenerate into ulcers. In the course of a week or ten days, a muco-purulent fluid is discharged from the nostrils, being at first yellowish, but soon having a bloody appearance, and an extremely offensive smell. In some instances it is thin and sanious, but is commonly viscid and tenacious, adhering to the sides of the nostrils and to the upper lip, and excoriating the parts with which it comes in contact. Sometimes this secretion does not appear externally, being thrown back into the fauces, and swallowed. Soon after the commencement of this

discharge, the mucous membrane becomes engorged and inflamed, and frequently terminates in gangrene. The salivary glands are sometimes swollen, the mouth and fauces inflamed in spots, and occasionally the larynx participates in the disorder, so much so as to endanger suffocation by the closure of the glottis. The lungs are frequently involved, and a cough with a rusty expectoration ensues. The face exhibits, in a peculiar manner, the effects of the disease. The nose is red and swollen, a gangrenous inflammation extends to the lips, eyelids, and forehead, the eyes are closed by tumefaction, and eschars form with awful distortion of the features.

As the severe local phenomena are developed, the skin becomes hot, the tongue more dry and furred, the respiration difficult, the pulse frequent, small, and feeble, urgent thirst, and an offensive diarrhœa. Finally, the body exhales a fetid odor, the mind wanders, coma and delirium occur, and by the end of the second week, or during the third, the patient sinks into extreme prostration from involuntary discharges, and death soon closes the scene.

The symptoms enumerated do not always occur in every case, the disease being liable to variations. In some instances, the nasal symptoms predominate, while in others the carbunculous and eruptive are the prominent features. But whatever course the complaint takes, it generally ends fatally.

Chronic Glanders.—In the mildest cases, the symptoms are sometimes confined to the nasal passages, and those communicating with them, from which an offensive glutinous, purulent, or sanious discharge ensues. Such cases may pass on for months, and finally recover. Generally, however, slight neuralgic or rheumatic symptoms appear, with redness at the seat of the pain, and those of a febrile character may be developed. Presently the nasal discharge appears, and together with suppurating tumors, may continue for months, and perhaps recover, but more probably terminate fatally.

Anatomical Characters.—Besides the external lesions which are seen during life, post-mortem examination reveals bloody infiltration, gangrene, and suppuration of the cellular tissue, thickening, softening, and redness of the Schneiderian membrane, which is covered with a grayish mucus, and studded with numerous minute white pustules, interspersed with patches of ulceration on the mucous membrane lining the cavities, denudation and caries of the

bone, and sometimes an opening through the septum. The same eruptive appearance is also presented in the soft palate and fauces; there are tumefaction of the glottis, and abscesses between the muscles. The alimentary canal, the heart, and the large interior glands are not prominently affected. On laying open the gangrenous tumors, the muscles are of a dark color, and appear decomposed, emit an offensive odor, and contain purulent matter, either in minute specks, or infiltrated through their structures. The blood retains its coagulability, and does not present the tar-like appearance generally found in malignant fevers.

Causes.—Glanders arises from a morbid poison generated in the horse, and is communicated either by contact of the poisonous secretion with an abraded surface, or by its introduction into the stomach, as when the patient has drank out of the same vessel as the animal, or through the medium of the atmosphere. It often affects persons who have lodged in the same stable, or been in close communication with the diseased animal, without any direct contact with an abraded spot. Others have taken the disease from washing the linen of persons diseased. The predisposition to the disease is much stronger in persons of filthy and intemperate habits.

Treatment.—In the treatment of this disease, the primary indications are to stimulate the emunctories sufficiently to eliminate the poison, at the same time supporting the strength of the patient. This can be best accomplished by giving him a thorough alcoholic vapor bath, followed by an active lobelia emetic, and a brisk, stimulating purge. Immediately after this round of treatment, two or three grains of sulphate of quinia, one or two grains of baptisin, and from three to five grains of prussiate of iron, should be given every two or three hours for twenty-four or forty-eight hours. If abscesses form, they should be opened, and washed with a moderately warm solution of sulphate of zinc. The nostrils should be syringed with warm water three or four times a day, to which a few drops of creasote have been added. The throat may be gargled with the same preparation. The strength should be supported by means of chicken broth, rice gruel, cream, punch, porter, ale, etc. If this course of treatment do not immediately arrest the progress of the disease, the vapor bath, emetic, and purge should be repeated every three or four days. During the interval the body should be tho-

roughly bathed in soda water once or twice a day, and the kidneys kept active by means of small doses of apocynin and barosmin. It may also be found necessary to repeat the tonics and antiperiodics occasionally. The diet should consist of stewed fruit, rare-cooked eggs, fresh vegetables, etc.

DENGUE.

Dengue, or Dandy Fever, is an exanthematous febrile affection, characterized by a high fever. violent rheumatic or neuralgic pains, and a cutaneous eruption.

It has always prevailed epidemically, having appeared in London in 1780, in Calcutta in 1824, in the West Indies in 1827, reaching New Orleans, Charleston, and Savannah, in the summer and fall of 1828. In 1850 it again visited the South, prevailing most extensively in Charleston.

Symptoms.—The symptoms of this disease, according to Prof. Dickson's account in his "Elements of Medicine," who described it as it prevailed in Charleston, are pain, more or less stiffness of the neck, back, and loins, and swelling of the muscles of the limbs and joints. There are intolerance of light, restlessness, chilliness, fever, headache, a full, frequent, and quick pulse, red eyes, a hot and dry skin, and intense thirst. The fever usually lasts from one to two days, when a gradual remission occurs, and the patient feels quite comfortable, although there are frequently more or less rheumatic pains and soreness of the muscles. After an interval of two or three days the fever returns, the pains are increased, the tongue becomes thickly coated, the stomach irritable, and the patient dejected and fretful. Nausea and epigastric uneasiness are prominent phenomena, but vomiting seldom occurs. Upon the subsidence of the paroxysm, or about the sixth or seventh day, an eruption makes its appearance, somewhat resembling that of scarlatina, which usually gives relief to the distressing symptoms. Sometimes the eruption consists of rough, darkish patches, as in rubeola; while in other cases, it is either papular, vesicular, pustular, or furunculous, and often there is a mixture of two or more of these forms, or it may present an erysipelatous appearance. In some instances, though rarely, it assumes a petechial form, the gums are red, spongy, and bleeding, and there are soreness of the mouth, and ulcers. The cu-

taneous eruption is attended with itching and heat, and sometimes with a secondary fever, and disappears after two or three days, the color of the skin gradually fading, with slight desquamation. The stiffness and soreness of the joints may continue, however, more or less troublesome for some time, the patient remaining weak and depressed in spirits. Sometimes the debility is alarming, with a slow, weak pulse, cold sweats, and a purplish or livid appearance of the eruption. The duration of the disease is about eight days. Sometimes the cases are very mild. It attacks all ages; and in some localities where it has occurred, almost the whole population has been affected by it.

Cause.—The probable cause of dengue is that of a concentrated miasmatic poison, acting in concert with a peculiar epidemic influence. The poison, on entering the blood, may affect, at an early period, the cerebro-spinal system, or its meninges, either directly, or by the congestion produced by the chilly stage, and thus the rheumatic character of the disease may result. As re-action is fully established, the blood, with the morbid poison, is carried to the minute capillaries in the vascular structure of the skin, where irritation and an eruption occur. This eruption acts as a counter-irritant to the cerebro-spinal system, and hence the symptoms are palliated on its occurrence. The swelling and irritation of the lymphatic glands are probably due to the poison in its passage through them.

Diagnosis.—As dengue always prevails in an epidemic form, little difficulty is presented in diagnosis, except in the first few cases which occur, which might be mistaken for rubeola, scarlatina, or yellow fever.

From measles, it is distinguished by the absence of catarrh. From scarlatina, it differs in the time that the eruption appears, it coming out later in dengue; and from both these diseases it differs widely in its neuralgic or rheumatic symptoms.

Treatment.—The treatment of dengue is essentially the same as that of scarlatina, of which it appears to be a species; or rather, a scarlatina complicated with rheumatism. A warm bath, and an emetic when the stomach is vitiated, followed by metastatic remedies, such as macrotin and scrophularia, in connection with quinine, iron, and acetate of potash, will usually relieve the complaint. If

there be severe pains, small doses of opium, or a few grains of Dover's powders, administered two or three times a day, will relieve them. Capsicum and tonics may also be required in some cases. Frequent baths, a generous diet, and out-door exercise, should be prescribed during convalescence.

PURPURA.

There are several varieties of this disease, as purpura simplex, or *petechial scurvy*, *purpura hemorrhagica*, *purpura nautica*, *and purpura scarlatina*. By the term purpura, we understand a greater or less number of livid spots on the skin, from extravasated blood. In purpura simplex, the effusion is confined to the skin and cellular tissue, mostly occurring on the arms, legs and breasts. The spots, at first, are small, resembling flea-bites, and frequently very numerous. The countenance is pale, and the patient complains of great debility, loss of appetite, irregularity of the bowels, and periodic fever. If the disease be allowed to progress, it will terminate in what is called purpura hemorrhagica, which is characterized by large petechiæ, interspersed with vibices, ecchymoses, or livid stripes and patches, resembling the marks left by the strokes of a whip, or violent bruises. They commonly appear first on the legs, and at uncertain periods afterwards, on the thighs, arms, and trunk of the body; the hands being more rarely spotted with them, and the face generally free. They are, usually, of a bright red color when they first appear, but soon become purple or livid; and when about to disappear, they change to a brown or yellowish hue; so that, as new eruptions arise, and the absorption of the old ones slowly proceeds, this variety of colors is commonly seen in the different spots at the same time. The cuticle over them appears smooth and shining, but it is not sensibly elevated; in a few cases, however, it has been seen raised into a sort of vesicles, containing black blood. This more frequently happens in the spots which appear on the tongue, gums, palate, and inside of the cheeks and eye-lids, where the cuticle is extremely thin, and breaks from the slightest force, discharging the effused blood. The gentlest pressure on the skin, even such as is applied in feeling the pulse, will often produce a purple blotch, like that which is left after a severe bruise. The same state of the system which gives rise to these

effusions under the cuticle, produces likewise copious discharges of blood, especially from the internal parts, which are defended by more delicate coverings. These hemorrhages are often very profuse and not easily restrained, and, therefore, prove suddenly fatal; but, in other cases, they are less copious; sometimes returning every day at stated periods, or less frequently, or there may be a slow and almost incessant oozing of blood. The bleeding occurs from the gums, nostrils, throat, inside of the cheeks, tongue, lips, and sometimes from the lining membrane of the eyelids, the urethra and the external ear; and also from the internal cavities of the lungs, stomach, bowels, uterus, kidneys, and bladder. There is the greatest variety, however, in different instances, as to the period of the disease in which the hemorrhages commence and cease, and as to the proportion which they bear to the cutaneous efflorescence.

This singular disease is often preceded, for some weeks, by great lassitude, faintness, and pains in the limbs, which render the patient incapable of any exertion; but, not unfrequently, it appears suddenly in the midst of apparently good health. It is always accompanied by great debility and depression of spirits; the pulse is sometimes quickened; and there are heat, flushing, perspiration, and other symptoms of febrile irritation, recurring like the paroxysms of hectic. In some patients, deep-seated pains have been felt about the præcordia, and in the chest, loins, and abdomen; and in others a considerable cough has accompanied the complaint, or tension of the epigastrium, right or left hypochondrium, with tenderness on pressure, and a constipated, or irregular state of the bowels. But, in many cases, no febrile appearances have been noticed; and the functions of the intestines are often natural. In a few cases, frequent syncope has occurred. When the disease has continued for some time, the patient becomes sallow, or of a dirty complexion, with much emaciation; and some degree of œdema appears in the lower extremities, which afterwards extends to other parts. The disease is extremely uncertain in its duration; in some instances it has terminated in a few days, while in others it has continued not only for many months, but even for years.

When the disease runs a rapid course and terminates in death, it is generally dependent upon the occurrence of hemorrhage into

some of the vital organs. Such is the disposition to hemorrhage in this stage of the disease, that although a patient may appear convalescent on retiring to bed in the evening, he may be suddenly seized with violent dyspnœa and orthopnœa, which rapidly increase until death ensues by asphyxia. In such a case, there has been a sudden effusion of blood into the pulmonary tissue, producing pulmonary apoplexy; or there may be acute hæmoptysis, caused by the escape of blood into the air passages. In this event, the hemorrhage may be controlled, and the patient recover under proper treatment. The hemorrhage may occur in other organs, as the brain, producing apoplexy and death; or, in the cavities of the chest and abdomen. It also occurs in the cellular tissue, producing extensive ecchymosis, inflammation, gangrene and death; or the purple spot may gradually assume a yellow appearance, absorption of the effused blood occur, and the patient recover.

In purpura nautica, the purple spot mostly occurs at the roots of the hair, on the gums, and mucous membrane of the mouth and pharynx. In this form of the disease, the gums become spongy, and bleed upon the slightest injury, the teeth are loose, and frequently fall from the gums; there are great debility, a sallow countenance, irregular sleep, and night-sweats, followed by fever; the bowels are irritable, and there is mælena. This latter form of it, Prof. I. G. Jones has treated as a separate disease, under the head of scurvy or scorbutus; and considers it the same as various writers have described as sea-scurvy, although he does not favor the opinion, at one time very prevalent, that salt water causes the disease; but states, that the cause is generally more of a positive than a negative character, being the want of such articles of food as furnish the system through the medium of the blood, with certain elements indispensable to life and health. He is of the opinion that these deficiencies consist in the lack of vegetable acids.

On comparing the description of scurvy by Profs. Jones, McIntosh, Bateman, and others, with purpura, as it is described by various authors, the only difference between what is known as sea-scurvy, and purpura, is the circumstances under which it makes its appearance; both evidently depend upon the same pathological condition of the system.

Cause.—The causes of the different varieties of this disease depend upon a deficiency of vegetable aliment, and long exposure to a damp atmosphere; a lack of due exercise, an unwholesome diet, and any thing which tends to an impoverished state of the blood. The influence of improper diet, in developing purpura, was remarkably exemplified in 1862. Owing to the failure of fruit, as well as the potato crop and other vegetables, bread, butter, and meats were the principal articles of diet; and purpura, which was hardly known in the country, became a prevalent disease. On examining the blood, it is found deficient in fibrine, but feebly disposed to coagulate, and very abundant in serum.

Treatment.—When the disease first makes its appearance in the simple form, little more is necessary than a liberal diet of fresh vegetables, with out-door exercise, and a small amount of muriated tincture of iron, say from five to ten drops three times a day. Where the disease assumes a hemorrhagic character, the following may be given:—Take quinine, fifteen grains; citrate of iron, thirty grains; capsicum, twenty grains. Mix, triturate, divide into eleven powders, and take one every three hours. The patient's diet should consist of green vegetables, salt meats, eggs, and the free use of lemonade, etc. After the powders are all taken, the following mixture should be given: —Take port wine, one pint; phosphate of lime, half an ounce; carbonate of iron, three drams. Mix, shake well, and take one tablespoonful three or four times a day. If effusion has occurred into the cellular tissue of one of the limbs, it should be carefully bandaged, and kept constantly wet in a strong liniment of camphor, whiskey, and spirits of turpentine. The bowels should be moved once or twice a week, by the use of antibilious physic and cream of tartar. The body should be frequently bathed in warm or cold water, as indicated.

Should hemorrhage occur in the bowels, lungs, or any other organ, the oil of erigeron may be given, in five or six drop doses, every half hour. If there should be melæna, and the oil of erigeron fail to arrest it, the nitrate of silver pill may be given as directed under the head of typhoid fever; or, from five to ten grains of matico may be administered every fifteen or twenty minutes, until the hemorrhage ceases. If there be much debility, porter, ale, or brandy should be given.

SECTION VII.

DISEASES OF THE DIGESTIVE SYSTEM.

STOMATITIS.

By Stomatitis, is understood inflammation of the mucous membrane of the mouth. The disease occurs in various forms. The inflammation may extend over the whole membrane, or be confined to small patches. When diffused, it may exhibit no peculiar symptoms, other than inflammation, or the surface may be covered with patches of curd-like exudation. It may be attended with eruption, ulceration, or gangrene, and this is especially the case when produced by mercurials.

Common Diffused Inflammation.—This may appear in isolated patches, or it may be general, involving the entire mucous membrane of the mouth. In some cases it is superficial, but more frequently it involves the entire mucous surface, extending sometimes to the submucous tissue, the sublingual and maxillary glands, and the absorbents of the neck. In the erythematous form it is characterized by redness, heat, and tenderness. Vesicles may form, and even ulcerations occur, destroying more or less of the mucous membrane. In certain constitutions, the ulcerative tendency is very strong, and may terminate in gangrene. There is generally a copious flow of saliva; though, in some instances, this secretion, as well as that of mucus, is checked, and the mouth is clammy or dry. The sense of taste is usually impaired, speech and mastication are often difficult and painful, and the tongue is covered with a white fur, or else it is red and glossy. When the gums are involved, they swell, and perhaps ulcerate, and in severe cases, a slight symptomatic fever may be developed.

Causes.—This form is more frequently a complication of other diseases, than an original affection. When of the latter character, it is generally caused by the direct action of irritant bodies, as by scalding drinks, acrid or corrosive substances and mercurials taken into the mouth, unhealthy secretions, decayed teeth.

Follicular Stomatitis, or Nursing Sore Mouth.—This is another form of stomatitis, characterized by red eminences, particularly observable upon the tongue and soft palate. When first seen, they are small, hard, round, whitish eminences, surrounded by a circle of redness. If the inflammation should not subside, the papillæ soften and ulcerate, and the surface of the ulcers is covered with a whitish adhering exudation. This ulceration may extend over the entire mouth, and in some instances to the esophagus and stomach, producing general constitutional disturbance. The ulcers may be distinct or confluent, according to the amount of mucous membrane involved. In its confluent form, it occasionally attends the last stages of eruptive fevers, and of various chronic diseases. It occurs during dentition, in the latter months of pregnancy, or in women while nursing.

Symptoms.—It commences with a loss of taste, and a sensation similar to that produced by scalding liquids. The surface is red, extremely tender and painful. The tongue is red and smooth, and there is a copious flow of saliva. The disease is at first local, being unattended with fever, or loss of appetite; but if not checked, it is apt to extend to the fauces and esophagus, through the Eustachian tube, into the cavity of the tympanum and nasal passages. The stomach and bowels become irritated, diarrhœa takes place, and the patient is greatly debilitated and emaciated. The disease, when caused by vitiated secretions produced by the disturbed condition of the lymphatics while suckling, frequently extends to the entire mucous membrane of the stomach and bowels, resulting in ulceration, diarrhœa, dysentery, dyspepsia, great prostration of the nervous system, impoverished condition of the blood; and if it be not arrested, the mucous membrane of the air-passages becomes involved, followed by cough, expectoration, tuberculous degeneration, and death. Not unfrequently the ravages of the disease upon the tissues of the mouth are so great as to entirely absorb the alveolar processes, causing the teeth to fall out, and some-

times extensive abrasions of the mucous membrane and sub-adjacent tissues occur. There is frequently fever of a periodical character, connected with this form of stomatitis, and sometimes nausea and vomiting. Usually there is anorexia during the entire progress of the disease, and constipation in the early stage.

Aphthœ, or Eruptive or Vascular Inflammation.—This form is characterized by small ulcers scattered over the surface of the tongue and lining membrane of the mouth. When they are fully formed, they are whitish, painful, and surrounded by more or less redness and inflammation; and if they be confluent, there is more or less constitutional disturbance. The distinct variety, though painful, is a light affection, continuing generally only a few days, or a week, and confined usually to the mouth. It produces little constitutional disorder. The *confluent* form is much more severe and obstinate, and frequently extends into the fauces and pharynx. When it occupies the fauces, deglutition is painful. It is frequently attended with gastric uneasiness, vomiting, intestinal pains, and diarrhœa. Fever usually anticipates the eruption. The complaint is not common, and occurs most frequently in adults. It may continue for several weeks, and sometimes prove fatal.

Thrush.—Thrush, another form of stomatitis, occurs most frequently in children, from one to three months old, and presents, in addition to the ordinary symptoms of mucous inflammation, patches of white exudation, appearing first on the inside of the upper lip, and gradually extending to the tongue, the roof of the mouth, the inside of the cheeks, and perhaps the fauces and pharynx. The exudation may become thick and absorbed, assuming a yellowish or brownish color, and leaving a reddish, raw-looking surface, or a foul and ash-colored spot. Successive crops may occur, the mouth becoming hot, and the voice more or less changed. In some cases the disease extends to the stomach and intestines, the patient being afflicted with acidity, colic pains, vomiting, and diarrhœa. Redness about the anus is not uncommon, depending probably on the acrid discharges. The child is often somnolent, especially in the worst cases. The affection is sometimes entirely local, though generally attended with some acceleration of the pulse, and febrile heat. Its duration is from eight to ten days. As the disease usually occurs, it is not attended with much danger; but if the surface be brown

or bluish after the separation of the crusts, gangrenous ulceration may take place, and the bowel discharges become slimy and shreddy.

Causes.—Thrush sometimes is the result of improper diet in children, or of unhealthy milk from a delicate or intemperate nurse; or of an accumulation of effete matter and lactic acid, which come in contact with the mucous surface of the child's mouth, while nursing, producing an abrasion.

Ulcerative Stomatitis.—Ulceration may occur in any form of stomatitis; but the complaint referred to here, is essentially ulcerative, appearing, from the commencement, in this form. It usually occurs in the gums, or inside of the cheeks and lips, and produces heat of the mouth, an increased flow of saliva, offensive breath, swelling of the upper lip, and enlargement, with tenderness of the submaxillary glands. The ulcer is generally painful, and attended with fever and constipation. If the disease passes on unchecked, the gums will be destroyed, the teeth exposed and loosened until they fall out, and the inside of the cheeks covered with irregular, sloughing ulcerations. It generally occurs in children, from two to six years old, and results from a debilitated state of the body, caused by deficient or unhealthy diet, impure air, want of cleanliness, etc.

Gangrenous Stomatitis.—*Gangrenous inflammation* of the mouth most frequently occurs in children; but it may appear at any age, if the system be in a depraved state. It exhibits a whitish or ash-colored eschar, situated upon the gums, most frequently between the lower incisors, though it may occur in any part of the mouth, or fauces, and is often seated on the inside of one of the cheeks. In the latter case, it is usually accompanied with considerable swelling. The exterior surface of the cheek is, for the most part, polished and whiter than in health. As the disease progresses, the patient becomes languid and weak, the slough spreads, the saliva flows copiously, the breath is very offensive, the alveolar processes are necrosed, the teeth fall out, and thus the disease passes on, till portions of the cheek, palate, and upper jaw are destroyed. In the progress of the gangrene, there are constitutional disturbances, the pulse is frequent and feeble, and the child very restless and morbidly wakeful. There is often an almost total inability to take food, thus increasing the debility. An exhausting diarrhœa, moreover, supervenes towards

the close of the malady. Death is preceded by cold extremities, and the other usual evidences of exhaustion.

The disease is most apt to attack children of feeble constitutions, resulting from impure air and unhealthy and deficient diet. It is most prevalent in malarial districts, and in places where children are crowded together. It may be the sequelæ of intermittents and remittents, and of many of the eruptive fevers.

Mercurial Stomatitis.—This form of inflammation of the mouth, resulting from the use of mercury, is first indicated by an increase of saliva, and a metallic taste in the mouth. There are some redness and swelling of the gums, stiffness of the jaws, when the mouth is opened, and the teeth feel as if they projected above their usual level. As the inflammation extends, the salivary secretion is much increased, the gums and palate become swollen, and the tongue is thickly coated and enlarged; there may be severe odontalgia, and pharyngitis, the breath is fœtid, ulceration and hemorrhage may occur, and in bad cases, sloughing may take place, and portions of the jaw-bone be laid bare. There is more or less constitutional disturbance. Death often closes the scene; but the patient generally recovers from the worst forms, though sometimes with a deformed mouth.

Treatment.—The treatment for common diffused inflammation of the mouth consists in removing the causes, such as carious teeth, false teeth, when secured by means of metals, and other substances that corrode, tobacco, etc. The disease may also originate from dyspepsia, and other disorders of the stomach, in which event the cause should be sought for and removed. At the same time, the mouth should be washed frequently with a warm decoction of hydrastis canadensis.

In *follicular stomatitis*, a more energetic and thorough course of treatment is required. In addition to removing the cause, the system should be well supported by tonics, a generous diet, and a liberal use of fresh succulent vegetable food, such as grapes, etc. The use of muriate of hydrastia, glycerine, and myricin, in the proportion of ten grains of hydrastia, five of myricin, and one ounce of glycerine, applied to the ulcerated patches, by means of a camel's hair pencil, will prove serviceable. At the same time, one or two grains of quinine, with equal parts of muriate of hydrastia

and pulverized ferro ferricyanidum, should be administered every two hours, for two or three days. Gargling and rinsing the mouth and throat with a mild decoction of rhus glabra and myrica cerifera, will also prove beneficial. Iron, cod liver oil, and hypophosphite of soda, in the proportion of one dram of the precipitate of the carbonate of iron, one-half dram of the hypophosphite of soda, three ounces of cod liver oil, and the same quantity of simple syrup, given every two or three hours, in connection with the above treatment, will generally establish convalescence.

Aphthous sore mouth is usually the result of algæ vegetation, or parasital developments on the mucous surface. This is peculiarly the case with the odium albicans. These parasites are easily destroyed by diluted sulphuric acid; ten or fifteen drops may be added to three or four ounces of water, and the mouth rinsed with it frequently; or, if the disease extend to the stomach and bowels, a teaspoonful may be swallowed every two or three hours. In severe cases, in addition to this, the same treatment should be pursued as recommended in the preceding forms.

The treatment for *thrush* is essentially the same as that of aphthæ.

In the *ulcerative* form, in addition to such constitutional treatment as may be required, the ulcers should be touched with a solution of nitrate of silver, of the proportion of one grain to an ounce of water; the application being made by a probang, once or twice a day.

In the gangrenous form, after the cause is removed, and a vigorous stimulating and tonic treatment adopted, the use of antiseptics, both as internal remedies and local applications, should be energetically applied. Among the best antiseptics with which we are acquainted, are baptisin, gum myrrh, comptonia asplenifolia, cinchoniæ, creasote and prussic acid. These may be used separately, or in combination, according to the urgency of the case. In some active forms of gangrene of the mouth, I have applied a hot solution of sulphate of zinc, by means of a probang, to advantage.

Mercurial stomatitis is best relieved by constitutional treatment, such as the free use of the compound syrup of stillingia, and a small quantity of sulphur.

GLOSSITIS.

By Glossitis, is understood inflammation of the substance of the tongue, involving its muscular tissue. It is generally an accompaniment of other diseases. The tongue is composed of muscular fibres, distributed longitudinally, transversely, obliquely, and vertically in layers, between which there is much cellular tissue. The tongue, thus constituted, is liable to be inflamed, and the structure is so vascular as to produce extensive œdema and ulceration.

Causes.—Glossitis may be produced by the usual causes of inflammation, although it more frequently results from direct injuries, such as wounds or bruises, or from irritating or corrosive substances, such as mineral poisons, especially *mercurial.* It may also be produced by extension of the inflammation in tonsillitis, and it occasionally arises in the course of exanthematous fevers, and chronic disease of the stomach.

Symptoms.—Glossitis generally commences with a throbbing pain in the tongue, which is soon followed by redness and swelling. In the course of a few hours, the inflammation extends throughout the organ, which enlarges so much as to fill the whole mouth, to force open the jaws, and sometimes to project considerably beyond the teeth and lips. The floor of the mouth is much depressed, the soft palate elevated, and the epiglottis, in some cases, so much pressed down as to threaten suffocation. Deglutition becomes difficult, if not impossible, and the patient is wholly unable to articulate. The tongue is generally of a darkish-red color, and dry upon the surface, though it may be moist, and covered with a thick whitish or yellowish fur. The system sympathizes, and a quick, active pulse, and hot skin, usually exist in the earlier stages; but as the complaint advances, the breathing becomes greatly embarrassed, the pulse loses strength, and cold sweats occur. The inflammation may terminate in resolution, suppuration, or gangrene. Sometimes permanent induration remains after the subsidence of the inflammation. If suppuration take place, abscesses may form. Less destruction is produced by gangrene than might be imagined from the large sloughs thrown off from the tongue; for when the organ shrinks to its original size, the loss is often found inconsiderable.

Treatment.—The treatment very much depends on the nature

and cause of the difficulty. When it arises from a disordered state of the stomach, an emetic of lobelia should be administered, followed by an active purge of antibilious physic, and the mouth frequently gargled with hot water, in which a little chlorate of potash has been dissolved. When it is an extension of tonsillitis, it is usually amenable to the treatment of that disease. If caused by scalds or burns, the mouth should be washed with a mucilage of flaxseed or slippery elm, and the tongue anointed frequently with equal parts of lime water and sweet oil. When it is produced by mercurials, sulphur vapor baths, equal parts of charcoal and yeast as a gargle, and the free administration of simple syrup of stillingia, will do much to mitigate the disease. If the inflammation be of an erysipelatous character, quinine, iron, mineral acids, mild purges, baptisin, and vegetable tonics, should be administered internally, while the tongue should be frequently sponged with a mild solution of sulphate of zinc, or diluted muriated tincture of iron. If the disease be produced by dyscrasia of the blood, such constitutional treatment as the nature of the case indicates should be pursued.

ANGINA.

Angina, or Inflammation of the Fauces.—The *fauces* include the different parts at the back of the mouth, which become visible when the lips are widely opened and the tongue depressed, such as the velum pendulum, the half arches of the uvula, the tonsils and upper portion of the pharynx. The different forms of inflammation which the fauces may undergo, are the *common*, the *pseudo-membranous*, or diphtheritis, the *ulcerative* and *the gangrenous*, or *malignant.*

Common Inflammation of the Fauces, or Sore-throat.—In this form, the fauces are of a bright red color, and there is more or less œdema; in the more advanced stages, they exhibit small whitish particles. The patient has a shooting pain from the throat to the ear, along the course of the Eustachian tube, and feels an irritating sensation of heat and dryness in the throat, with constant soreness, which becomes acute when he attempts to swallow. A viscid mucus is secreted after a time, which leads to repeated efforts to clear the fauces, and, when discharged, is sometimes accompanied with blood. The uvula is, occasionally, much swollen and elongated. When this is the case, there is a frequent desire to

swallow, and to clear the glottis by coughing or expelling the air through the nostrils; and sometimes vomiting ensues. In many cases, there is very little constitutional disturbance; while in others, there are a dry, hot skin and irritable pulse, chilliness, headache, and loss of appetite.

Dr. R. B. Todd, of London, describes a variety of angina, which he considers erysipelatous. The inflammation generally runs for several days, then declines gradually, terminating in resolution. In some instances, suppuration occurs in the uvula, and gangrene may ensue in debilitated and unhealthy constitutions. The tonsils may become inflamed, and the external parts participate in the disease, the jaws becoming stiff and painful, and the absorbent glands swollen. The most unpleasant ordinary result, is the extension of the inflammation downward into the larynx and lungs, and, in some cases, severe bronchitis follows, if the disease be not checked. At other times, the Eustachian tube participates in the inflammation, and partial deafness results from its closure.

Chronic Angina.—Inflammation of the fauces frequently assumes a chronic form, in which there is a constant feeling of heat and uneasiness, with some redness of the parts, which, with alternations of remission and exacerbation, may continue for many months. A membrane sometimes appears irregularly thickened, or exhibits small eminences, particularly observable on the soft palate and pharynx, produced by the enlarged mucous granules. These granulations are often covered with a muco-purulent secretion. Ulcers sometimes form. Occasionally, this inflammation is accompanied by a copious exudation, while, in others, the fauces remain red, swollen and dry. The affection is often attended with a constant hawking, in order to clear the fauces. A dry laryngeal cough sometimes occurs, resulting from the irritation of the glottis.

Causes.—The causes of acute and chronic angina, are a vitiated condition of the system, colds, scrofulous and tuberculous constitutions, irritating or corrosive substances swallowed, acrid eructations from the stomach, spermatorrhœa, and other causes, which tend to debilitate and exhaust the system.

Ulcerated Inflammation of the Fauces.—Ulcers in the fauces occur occasionally in common angina, particularly in its chronic state, and are attendants upon various constitutional acute and chronic

affections. They, however, sometimes occur as an original disease; at least. they are present when the case first comes under medical notice.

Symptoms.—There is a sharp pain in swallowing, roundish or oval whitish spots exhibit themselves upon the fauces, surrounded by a red and inflamed margin. The spots sometimes remain nearly of their original dimensions, or they spread to a great extent. The whitish matter disappears after a while, leaving a red, excavated, somewhat irregular surface, which, in healthy constitutions, quickly rises to the proper level and cicatrizes. In others, there is a complete absence of febrile action.

Gangrenous Inflammation of the Fauces.—It is doubtful whether any distinct disease exists which merits this title. Gangrene occasionally attends inflammation of the fauces of all varieties. In common angina, the pseudo-membranous variety, and even in ordinary inflammation of the tonsils, portions of the mucous membrane, and of the structure beneath it, sometimes become sphacelus, and deep sloughs form. In fact, whenever intense inflammation of the fauces occurs in persons whose health has been depraved by insufficient or unwholesome food; or who are affected with some malignant or typhoid disease, or a dark-red or livid eruption; or in whom mortification exists in some other part of the body, we may apprehend gangrene, especially in children.

Treatment.—In the treatment of simple angina, originating from the ordinary causes of inflammation, but little more is necessary than a warm soda bath, a mild purge, and gargling the throat with warm water. Where it originates from specific causes, as mercury, syphilis, etc., a constitutional treatment, adapted to the nature of the cause, will be required. If associated with a vitiated constitution of a scrofulous or tuberculous character, a thorough tonic, supporting and invigorating course of treatment is indicated, such as cod liver oil, iron, the hypophosphites, heavy petroleum, baths, a nutritious diet, country air and topical applications of hydrastin, gallic acid and comptonia asplenifolia.

In the ulcerative form, the throat should be gargled frequently with a weak infusion of capsicum; and if it be gangrenous, ten drops of creasote may be added to four ounces of water, and alternated with the capsicum. Quinine, iron, baptisin and leptandrin

should be administered internally. If there are deep sloughs, they may be touched with a weak solution of sulphate of zinc or nitrate of silver. A gargle of myrrh, bayberry and baptisia tinctoria has also been used with good success.

TONSILLITIS, (QUINSY.)

The tonsils, two glandular organs situated between the anterior and posterior pillar of the soft palate, on each side of the fauces, are composed of an assemblage of mucous follicles opening through the mucous membrane, which lines their inner surface, and pouring out a transparent viscid mucus, which lubricates the fauces, and favors deglutition. Thus situated, the tonsils are liable to become inflamed.

Tonsillitis, cynanche tonsillaris, or quinsy, occurs with very unequal severity in different cases, according to the extent of the disease, and the number and variety of the parts involved, for it is seldom entirely limited to the tonsils. When the inflammation is superficial, it does not produce any great distress, even though it may be diffused. When it penetrates through and beyond the mucous membrane, it is liable to terminate in suppuration, abscesses, and extensive œdema of the parts, producing not only great difficulty in deglutition, but seriously obstructing respiration. In some cases the inflammation extends to the sub-adjacent tissues and assumes an erysipelatous character, in which event gangrene and mortification may occur. In other cases, it may terminate in resolution.

Causes.—Some individuals are predisposed to the disease, especially those of a strumous diathesis. The only exciting cause worth mentioning, is that of sudden exposure to cold.

Symptoms.—The disease usually commences with slight chills, succeeded by much febrile excitement, attended with an uneasy feeling in the throat, and difficulty of swallowing. In a few hours the uneasiness in the throat and tonsils increases, and deglutition is more difficult and painful, till at last it is almost impossible. There are more or less inflammatory redness and swelling of one or both tonsils. The tongue is covered usually with a thick layer of transparent mucus, and is sometimes swollen. There is a constant disposition to swallow, in order to free the fauces from a tenacious, colorless mucus, which adheres to them. The voice is much changed,

assuming a nasal character, and when the disease is at its height, it is sometimes quite suppressed. Occasionaly there are tinnitus aurium and partial deafness, owing to obstruction of the Eustachian tubes. The respiration is not much affected, except in very bad cases. When the tonsils are very much swollen, the breathing becomes impaired. There is generally external inflammation, with swelling of the cervical glands and the cellular tissue, and so much stiffness of the jaws, that when the disease is at its height, the mouth frequently can scarcely be opened, and the inflamed parts only examined by means of the finger. Sometimes even the finger cannot be introduced, and the tongue is incapable of any motion. The pain, in quinsy, is felt almost exclusively in deglutition. The patient is unable to swallow even soft solids; and in severe cases, pain shoots from the throat to the ear along the course of the Eustachian tube, which is indicative of suppuration.

Tonsillitis is usually attended from the very commencement by fever, severe headache, and a rapid pulse. It terminates in resolution or suppuration. When the inflammation is slight, or has been actively treated, it ends in the former, but the latter is the more frequent result. Rigors sometimes anticipate and accompany this process, and afterwards the pus is seen shining through the membrane covering the tonsils; again, it lies so deep that it cannot be detected. At length an opening occurs, with a discharge of the pus, and relief follows. The matter discharged is very fœtid, and has a nauseous taste. In some rare cases, the abscess opens externally. The discharge often occurs during sleep, and the patient awakes entirely relieved, without knowing when the change took place. The pus is generally swallowed. The disease is usually about a week in arriving at its height. Frequent attacks of quinsy generally produce an enlargement of the tonsils. Sometimes the tumefaction is so great as to produce difficult deglutition, and an alteration of the voice.

The prognosis of the disease is usually favorable.

Treatment.—The most radical method of treating tonsillitis is to administer a free lobelia emetic, and apply a strong acetic tincture of fel bovinum to the throat, followed by hot packs. In ordinary forms of the disease, if this treatment be instituted in the early stage, it will produce a solution of the disorder by resolution, in from

twenty-four to forty-eight hours. But when the disease has become advanced, and there is extensive œdema produced by extravasation of liquor sanguinis into the cellular tissue, it is more than probable that an abscess will form. To prevent this, I have frequently applied a strong solution of hot sulphate of zinc, by means of a probang, although if pus has already formed to any considerable extent, it is better to make a free incision, and allow it to escape. Care should be taken in opening abscesses of the tonsils, to cut from without inwards, otherwise there may be danger of wounding the internal carotid. In malarial districts, it is usually advisable to administer a round of antiperiodics in connection with iron, and where there is fever, veratrin, or the tincture of veratrum, should be given to control it. Gargling the throat with hot water, and inhaling warm vapor, will sometimes prove serviceable. The application of nitrate of silver has also been successfully applied by some practitioners. I have found a gargle of hydrastis canadensis, used freely, beneficial when the disease has resulted in abscess. In case that it terminates in induration and permanent enlargement of the tonsils, compound syrup of stillingia and iodide of potassium may be administered. Where there is a strumous habit, cod liver oil, iron and general tonics are indicated to prevent a recurrence of the disease.

PHARYNGITIS.

The pharynx is situated anterior to the cervical portion of the vertebral column, and extends from the base of the scull to a point corresponding with the cricoid cartilage in front, and with the fifth cervical vertebræ behind. It is a musculo membranous sac, communicating, anteriorly, with the cavity of the nose, mouth and larynx. It is attached above to the bacillar process of the occipital bone partly by muscle, but chiefly by aponeurosis; and below it is continuous with the esophagus; and, like other membranes, is liable to be inflamed; yet, it is of less frequent occurrence than angina; and when it does appear in a mild form, not extending to the larynx, the patient experiences little suffering, and no alteration of voice.

The chief diagnostic symptoms are tenderness on pressure, and a slight degree of pain, opposite the top of the larynx, in the act of

swallowing, the effort to accomplish which is constantly provoked by a secretion of mucus. It is seldom attended with much fever, and terminates, usually, in resolution. In severe cases, however, abscesses form between the textures composing the pharynx, and also between its posterior wall and the cervical vertebræ. These abscesses result mostly from disease of the vertebræ, causing great difficulty in deglutition and dyspnœa. In this stage, the voice is altered, and a dull pain and stiffness in the neck are felt.

Simple pharyngitis is a sporadic disease, mild in its character and innoxious in its tendency.

Sub-acute pharyngitis is very common, easily controlled, and brief in duration. In its acute form, the inflammation may be limited to the mucous membrane, and simply constitute an erythematic affection, unattended with exudation of lymph. It sometimes, however, extends upwards into the posterior nares, and downwards into the lower portion of the pharynx, producing a peculiar throat cough, caused by the forcible current of expired air depressing the pharynx. When an exudation of lymph occurs, it assumes a diphtheritic character; and when there is suppuration in the areolar tissue, beneath the mucous membrane of the pharynx, it is denominated a *retro-pharyngeal abscess.*

Acute pharyngitis may also occur as an *epidemic* affection. In the spring of 1864, it was very prevalent in New York, in some respects resembling influenza, distressing while it lasted, but seldom proving fatal.

In chronic pharyngitis, the membrane is, more or less, reddened, and irregularly thickened, presenting a granulated appearance, principally on the posterior wall of the pharynx. Upon examining the throat, mucus may, occasionally, be discovered adhering to the part, and around the apex of the pharynx. The patient may be said to have catarrh; he experiences a dry, hacking cough; finds himself hoarse after much speaking, accompanied by a sense of fatigue in the vocal organs; and hence, it has often been called *the clergyman's sore throat*, or *dysphonia clericorum.* Some physicians, however, question the propriety of this limited appellation, inasmuch as it is contended that it is not *solely* induced by the labored use of the voice. Persons of sedentary habits, and incessant attention to business in the counting-house or office, who allow them-

selves no physical repose nor mental relaxation, are frequently subject to chronic pharyngitis.

It may here be as well to observe that, owing to the obstructed respiration and the changed voice, chronic pharyngitis is liable to be mistaken for laryngitis. The chief symptoms, however, by which it can be distinguished, are the seat of pain and the inability to swallow.

Causes.—The ordinary causes of inflammation may produce pharyngitis, but it is more frequently the result of a vitiated constitution; hence, we find both acute and chronic pharyngeal inflammation occurring in scrofulous or consumptive patients. It may also be produced by an active and long-continued use of the voice by public speakers. The practice of taking frequent sips of cold water, while the pharynx is in a state of temporary hyperæmia, as is the case during preaching, lecturing, etc., is a prolific source of the disease. It is much more liable to occur in such cases, if the atmosphere in which the person is speaking, be impure. It is also produced by smoking, drinking hot tea or coffee, and eating highly-seasoned food. It also arises as the result of chronic dyspepsia, especially where there are fermentation, and frequent eructations of gas from the stomach.

Prognosis.—In a healthy constitution, pharyngitis usually terminates favorably in a few days, under judicious treatment; but in a scrofulous or tuberculous patient, it frequently proves an obstinate affection.

Treatment.—In the treatment of simple pharyngitis, but little more is necessary than to regulate the stomach and bowels, the external application of cold packs, and a few days rest.

In the chronic form, where there are constitutional effects, a thorough invigorating and tonic course of treatment should be pursued. The remedies adapted to these cases, are cod liver oil, hypophosphite of lime, iron, heavy petroleum, and general tonics, in connection with rest, baths, and pure air. To relieve the local difficulty, one grain of stillingin may be triturated with one dram of sugar, and divided into ten powders, of which one should be given every hour or two. When laryngeal abscesses occur, connected with great œdema, it may be necessary to open them; and in case there is extensive thickening or hypertrophy of the mucous

membrane, the application of a weak solution of nitrate of silver, by means of a probang, has proved beneficial. The inhalation of hot vapor, from bitter herbs, has also been highly recommended. I have cured several cases by giving teaspoonful doses of acetic syrup of sanguinaria, in connection with proper constitutional treatment. When the disease is maintained or produced by a disordered condition of the stomach, a lobelia emetic, administered occasionally, will prove of the greatest benefit. Chafing liniments applied to the throat, in some forms of the disease, have been followed by relief. In one case which came under my charge, I succeeded in curing the disease, by adding ten drops of the tincture of iodine to six ounces of water, and giving one teaspoonful every two or three hours, in connection with a gargle of chlorate of potash, in the proportion of one dram of the potash to eight ounces of water.

PAROTITIS, (MUMPS.)

Parotitis is an inflammatory affection of the salivary glands, particularly the parotid. The parotid, the largest of the salivary glands, consists of an aggregation of glandular structure, provided with excretory ducts, which unite to form the stenon canal. This canal passes forward horizontally, and terminates in the mouth, opposite the second upper molar teeth. The parotid glands secrete saliva, which is poured through this duct into the mouth, to moisten the food as it is masticated.

Causes. — A specific contagion is the most frequent cause of mumps. It may originate from endemic or epidemic influences.

Symptoms. — Parotitis generally commences with some febrile symptoms, a stiffness of the jaws, and a slight pain or swelling in one or both parotid glands. The swelling increases until the submaxillary and sublingual glands become implicated, and may extend from beneath the ear along the neck, towards the chin. The parts are hot painful, and very tender upon pressure. Mastication and deglutition are generally painful; and though there is only a slight fever, there are considerable restlessness and nervous irritability. After the swelling of the parotids begins to decline, the mammæ in the female, and the testicles in males, are liable to become painful and swollen. Inflammation of the brain, or its meninges, sometimes occurs on the subsidence of the parotid

swelling. The disease reaches its height in about four days, and then declines, disappearing entirely about the seventh, being succeeded with perspiration about the face, and sometimes over the whole body.

Treatment.—In the treatment of mumps, but little more is necessary than for the patient to keep quiet, and to take a mild saline purge, such as six or eight fluidounces of citrate of magnesia, or a sufficient quantity to gently move the bowels. The swelling and pain of the parts may be relieved, by occasionally applying a liniment composed of equal parts of lime water, sweet oil, chloroform, and laudanum. If there be fever, the surface may be sponged with tepid water, and a few drops of the tincture of veratrum, given to control it. If there be a metastasis of the disease to the brain, or other parts of the body, small doses of macrotin, in connection with quinine, and more brisk purging, will generally remove the difficulty. If, however, it recedes to the testes, and there be much inflammation, the parts should be bathed freely with the following liniment:—Take tincture of iodine, one ounce; olive oil, two ounces; lime water, two ounces. Mix, and apply freely, by means of a flannel cloth. If this should not remove the difficulty, hot packs, wet with tincture of opium, should be applied, and frequently renewed.

ESOPHAGITIS.

By esophagitis, is understood inflammation of the esophagus, that portion of the alimentary canal extending from the pharynx to the stomach, passing behind the trachea, along the posterior mediastinum, and into the abdomen through the esophageal opening in the diaphragm. The esophagus conveys the food from the mouth, or pharynx, to the stomach, for which purpose it is provided with longitudinal and annular muscular fibres, its lining mucous membrane being continuous, above, with that of the pharynx, and, below, with the mucous membrane of the stomach. The esophagus is less liable to disease than any other structure in the human body; but, when it becomes inflamed, it is quite difficult to detect it until ulceration and constriction take place.

Symptoms.—Heat and pain, aggravated, more or less, by swallowing at some point along the tube; but, generally at the lower extremity of the pharynx, or the cardiac orifice of the

stomach, are the earliest symptoms. Occasionally there is pain between the shoulders, and, perhaps, tenderness on pressure, with more or less difficulty in swallowing. The complaint is sometimes attended with hiccough, and, perhaps, with an eructation of a glairy mucus, and vomiting. There is, also, more or less constitutional disturbance, as debility, hot skin, scanty urine, etc. The inflammation generally terminates by resolution, though suppuration sometimes takes place, small abscesses forming in the submucous cellular tissue. Ulcers may form, or an adventitious structure be developed along the esophagus, which materially obstructs the passage of the food to the stomach. Esophagitis is usually of an acute character, but, occasionally it becomes chronic, in which case we have the symptoms of the former in a moderated degree, and particularly a copious discharge of mucus from the mouth.

Causes.—The general causes are acrid, corrosive or hot substances swallowed, mechanical violence from sharp, rough, or hard bodies introduced into the esophagus, or from undue efforts by the surgeon in the use of the stomach tube, the bougie or the probang. It may, also, be an extension of inflammation, either from the pharynx or the stomach, or result from the retrocession of various cutaneous affections, and from rheumatism.

Stricture of the Esophagus.—Of the chronic diseases of the esophagus, stricture is the most common. The narrowing may take place at any part of the passage, and a large pouch sometimes forms in front of or behind it.

Causes.—Stricture of the esophagus may result from preceding inflammation and ulceration, by granulation or cancerous infiltration, or from the presence of a tumor or an aneurism.

Symptoms.—The symptoms are a great difficulty in swallowing, and a hot and burning sensation, as the food passes over the constricted part; even liquid foods cannot pass without great pain; and if the stricture goes on increasing, there is great constitutional debility and weakness; and, finally, the patient, if not relieved, perishes from starvation. This stricture may sometimes be only *spasmodic*, and thus nourishment is swallowed very easily.

Treatment.—In the treatment of the acute form, the cause should be removed, the stomach cleansed by a lobelia emetic, the bowels

opened by a saline purge, the surface sponged with hot soda water, and sufficient tincture of veratrum viride administered to maintain a gentle diaphoresis. When the disease becomes chronic, in addition to the emetic, and an occasional purge, one dram of the iodide of ammonia, or of potassium, may be added to six ounces of compound syrup of stillingia, and one teaspoonful administered four or five times a day. I recently cured a case of chronic esophagitis, where there were entensive hypertrophy of the mucous membrane, and narrowing of the passage, by giving one-sixteenth of a grain of podophyllin, one-half grain of menispermin, and two grains of the muriate of ammonia, every two or three hours, during the day. I confined the patient mostly to vegetable diet of a fluid character.

When the inflammation is connected with a vitiated constitution, chalybeates, tonics, cod liver oil, and a general invigorating course of constitutional treatment, will contribute much to overcome the difficulty. If there be ulceration, frequent sips of the decoction of hydrastis canadensis, in connection with a mucilage of slippery elm, may be used; and, in some cases, a weak solution of argenti nitras, applied by means of a probang, has been found serviceable. When there are stricture, and great difficulty in deglutition, the esophagus may be dilated by introducing a bougie. At first, the bougie should be small, but gradually increased in size as the obstruction decreases. Anointing it with glycerine and muriate of hydrastia, will also prove beneficial.

In cancer of the esophagus, but little can be done by way of medication, although I cured a case pronounced cancerous by several physicians, with Donovan's solution, by giving five drops four times a day, for two or three weeks, in connection with Glauber's salts; one ounce of the salts was added to one pint of water, and one tablespoonful administered every night before retiring.

GASTRITIS, OR INFLAMMATION OF THE STOMACH.

The stomach, it will be remembered, is an expansion of the alimentary canal, situated between the liver and spleen, beneath the diaphragm, occupying the epigastrium, and a portion of the left hypochondrium. The stomach has three coats—the mucous, muscular, and serous—and is continuous above with the esophagus, and

below with the duodenum, and is that part of the alimentary canal in which the food is converted into chyme. The stomach is liable to become inflamed in all its coats, especially its mucous membrane. Gastritis may exist either in an acute or chronic form.

The acute form usually commences with violent vomiting, and sometimes purging, attended with a burning pain in the epigastrium, aggravated by the slightest pressure, and deep inspiration, and it sometimes becomes excruciating. There is, occasionally, considerable difficulty in deglutition. The substances ejected from the stomach consist, first, of the ingesta, mixed with mucus, afterwards blood and bile. The thirst is intense, and the tongue is either dry, and smooth, or covered in the middle and posterior parts with a whitish fur, its tip and edges being red, and papillæ elevated. If the inflammation be confined to the stomach, there is constipation; but if the bowels be involved, there is diarrhœa. The brain sometimes sympathizes with the stomach, producing violent headache, delirium, and prostration of strength. The pulse is frequent, and often full, generally small and corded, the respiration often short and hurried, the skin hot and dry, and the urine high-colored. A short sympathetic cough sometimes attends, and the voice may become altered, or nearly extinct. As the disease advances, the tongue becomes more dry, the skin cool and pale, the pulse more frequent, feeble, thread-like, and intermittent, the body emaciates rapidly, restlessness and debility increase, delirium, hiccough, and the regurgitation of black matter, like coffee-grounds, frequently occur; the tenderness on pressure diminishes, the pain sometimes entirely ceases, the countenance is cadaverous, and finally the extremities become cold, and the patient dies. If perforation of the stomach take place, the pain suddenly increases and becomes more diffused, and extreme tenderness upon pressure is felt over the whole abdomen, which swells and assumes a tympanitic condition, and each breath is attended with a groan. Inevitable death speedily follows these events.

Gastritis may, however, assume a much milder form; there may be merely a feeling of oppression, weight, or constriction, and slight nausea and vomiting, which may continue for several weeks, while violent cases may terminate in one or two days, especially if the inflammation be attributable to some irritating poison.

Causes.—Corrosive and irritating poisons received into the stomach, cold water taken when the body is heated, over-distention of the stomach with indigestible food, stimulating drinks, and mechanical injuries of the epigastrium. This disease, however, occurs mostly as an attendant upon other affections.

Acute inflammation of the stomach may terminate in resolution, gangrene, or mortification. If in resolution, the symptoms gradually mitigate, the nausea and vomiting diminish, the pulse is more full and less frequent, the epigastric tenderness subsides, the tongue assumes its normal appearance, and the general condition is that of convalescence. But if gangrene or mortification occur, the pain and epigastric tenderness suddenly subside, the vomiting consists of the ejection of dark, disintegrated blood and mucus from the stomach, the extremities become cold, the pulse disappears at the wrist, and the patient is immersed in a colliquative perspiration. The intellect is usually clear; and the disappearance of the pain, together with the febrile excitement and other symptoms, usually deludes the patient with the idea that he is convalescent. Soon, however, symptoms of syncope manifest themselves, and in a short time the patient expires.

Diagnosis.—Acute gastritis may be distinguished from cramp and flatulent pains by the following symptoms:—In gastritis the pulse is small, tense, and thick; while in flatulency, cramp, etc., there is seldom vomiting, and warm drinks produce no unpleasant effects. The pain continues in gastritis, unless temporarily alleviated by cool drinks, while in cramp it frequently intermits for several minutes. In cramp the skin remains almost natural, and the pain is sharp, cutting, and extremely severe; while in gastritis, the skin is hot and dry, and the pain of a burning, stinging character. In gastritis the patient lies on his back, and moves as little as possible; while in spasm he walks about with the body bent forward, or throws himself about the bed. Finally, pressure over the stomach in gastritis is attended with some degree of soreness, and an increase of pain; while in cramp, pressure usually affords some relief.

Anatomical Characters.—The stomach is found contracted, and its mucous membrane more or less wrinkled. When death has occurred suddenly, as in violent cases, there is usually discoloration,

with but slight ulceration of the mucous membrane. But in some cases that prove fatal at a later stage, there are ecchymosis and ulceration, and some portion of the membrane is in a softened and broken-down condition, as in mortification.

Prognosis.—A gradual diminution of the pain and vomiting, a sedimentous urine, a gentle moisture of the skin, and a more developed pulse, indicate a favorable issue. But if the vomiting increases, and the respiration becomes difficult, the pulse smaller, more frequent and corded, and if the pain suddenly subsides, the prognosis is very unfavorable.

Treatment.—In the treatment of gastritis, the stomach should be thoroughly evacuated, and cleansed by means of large draughts of warm water. The bowels should be opened by large and copious enemas of the same. The surface should be sponged with tepid water, and a large hot pack applied over the epigastrium. This should be frequently changed, and applied as warm as the patient can bear it. To arrest the vomiting, five or six drops of the wine tincture of ipecacuanha may be added to four ounces of water, and a teaspoonful administered every ten or fifteen minutes. To control the febrile excitement, half a dram of the tincture of corollorrhiza odontorrhiza may be added to a tumbler of water, and a teaspoonful administered every few minutes. When the disease is produced by an irritant or corrosive poison, in addition to the above treatment, such antidotes as will neutralize the poison should be given. Benefit may also be derived from the use of large draughts of mucilaginous drinks, as marshmallow, flaxseed, slippery elm, gum water, etc. When there are symptoms of gangrene or mortification, baptisin, creasote, and pyroligneous acid, are the remedies. The extremities may be chafed by means of stimulating liniments, and the patient should be kept quiet in bed.

During the treatment and convalescence, the nutriment should consist of barley water, oatmeal gruel, gum water, toast, tea, and rice gruel. All solid food and stimulating drinks should be prohibited.

Chronic Gastritis.—Chronic inflammation of the stomach is a very common disorder. It is generally of a mild character, unless of long continuance, when it may produce thickening, ulceration, or

narrowing of the pylorus. The ulceration may become deep, and terminate in perforation.

Symptoms.—When not the result of the acute form, this affection approaches so gradually, that it seldom attracts attention, until it has made considerable progress. The early symptoms are usually those of indigestion, such as acidity, flatulency, a sense of oppression after eating, eructations, and transient pain in the region of the stomach. As the disease advances, the epigastrium becomes somewhat distended and tender, and nausea and vomiting frequently occur an hour or two after eating. In some cases there is a thick, ropy substance raised from the stomach; in others, an acrid, watery fluid. The appetite is precarious. In the early stages it is sometimes very little affected; but later, it fails entirely, and the patient manifests a feeling of disgust for food. The taste is often vitiated, and substances leave an impression of sourness in the mouth. There is usually thirst, with a desire for cold drinks, which, if moderately taken, afford relief. Constipation almost invariably exists, unless the inflammation has extended to the bowels, in which case there is diarrhœa. The patient becomes dejected, impatient, and irritable. The tongue is generally coated with a yellowish or whitish fur, with the reddened papillæ projecting, or is red and smooth, or the papillæ only may be reddened and enlarged. In the advanced stages, it is sometimes covered with aphthæ, or a thrush-like exudation, supposed to indicate ulceration of the stomach. The pulse is usually more frequent and tense, occasionally it is irregular and intermittent. The skin is almost invariably dry, and in some cases there is a disposition to eruptive affections. The saliva is often sour, the bile scanty, superabundant, or deranged, and the urine variously disordered. The sympathetic disorders of the nervous system are numerous and diversified. There are great prostration and indisposition to bodily and mental exertion.

The duration of the disease is of long continuance; it not unfrequently exists for years. Under a favorable course of treatment, the disease may be arrested, and the patient recover from the most alarming symptoms. Even when ulceration has taken place, the disease may end favorably. When death occurs, it is generally preceded by great emaciation and debility, and sometimes by hectic fever. A fatal issue is sometimes produced by peritonitis, caused by the contents of the stomach having escaped through an ulcerated

opening into the cavity of the abdomen. The ulcers having destroyed almost all the thickness of the coats, any mechanical violence may rupture the remaining slender portion.

Numerous varieties of chronic gastritis exist. The symptoms may be mild throughout the whole course of the disease, or they may be very much aggravated, after the mild form has continued for a little time. When the inflammation is confined to a small portion of the stomach, the disease is generally very mild at the commencement, but it may suddenly break out with great violence, and ulceration and other organic mischief be exhibited. It is also very insidious in its approach in perforation. This condition may result from sloughing or rupture of the peritoneal coat of the stomach; but it is oftener caused by some pressure, which suddenly breaks the thinned and fragile membrane. When it occurs, the patient may scream out with the acute pain in the epigastrium, which soon extends over the entire abdomen. Groans attend every breath, and after a slight arterial reaction produced by warm drinks, the system sinks, and the patient dies within twenty-four hours.

In females, the disease has a remarkable influence upon the menstrual functions, producing amenorrrhœa, dysmenorrhœa, and leucorrhœa, connected with a high state of nervous irritability, dejection of spirits, and in some cases with hysteria. The system becomes emaciated, the muscles soft, and the countenance exhibits a haggard and anxious expression.

In males, it gives rise to spermatorrhœa, despondency, and gloom.

Causes.—Irritating substances acting on the mucous coat of the stomach, such as heating or indigestible articles of food, acrid mineral substances, long-continued mental excitement, alcoholic liquors, tobacco, rapid eating and imperfect mastication, repelled cutaneous eruptions, the drinking of large draughts of ice-water at meals, or it may arise from congestion of the portal circle, dependent upon disordered conditions of the liver, or from phthisis, or as the result of the acute form. It may also be produced by reading novels and exciting literature, and other influences which cause a morbid condition of the nervous system. It is also produced by drastic and irritating medicines.

Diagnosis.—It may be confounded with dyspepsia, gastralgia, and cancer of the stomach. From *dyspepsia* it differs in there being more pain at some particular point, more frequent vomiting after

taking food, more redness of the tongue, more weakness and general emaciation. From *gastralgia*, it differs by the pain being more continuous, and of a stinging character, the tongue is more dry, and either red or coated, and the appetite more variable; while in gastritis there are tenderness on pressure, a frequent pulse, hot or dry skin, a sallow countenance and general emaciation, which symptoms exist in a more moderate degree in gastralgia. It differs from *cancer in the stomach*, in there being no tumor in the epigastric region, the absence of vomiting of cancerous cells, the dry, red, or coated tongue, and the non-appearance of the cancerous diathesis.

Anatomical Characters.—The portions of the mucous membrane which have been inflamed, exhibit either a gray, red, brown, or blackish color. In some instances innumerable minute black points are seen, giving the surface a dark or grayish appearance. Occasionally dull white patches are observed, and the mucous coat may be thickened in spots, or to a considerable extent, and present a granulated appearance, either from an enlargement of the gastric glands, or from an exudation into the tissue of the membrane. The membrane may be indurated, softened, or ulcerated, the ulcers penetrating in some cases the muscular, and even the peritoneal coat. If perforation has taken place, the edges of the orifice may be rough.

Prognosis.—If proper treatment be administered in due season, the prognosis is generally favorable. But if the case be neglected, and the imprudence which led to it continued, ulceration and perforation may occur, and thus the prognosis is always unfavorable.

Treatment.—The treatment of chronic gastritis depends much upon the stage of the disease, and the associated conditions. In all cases the exciting cause should be sought, and, as far as practicable removed. The diet should be well regulated, and composed of such articles as are easily digested. Under ordinary circumstances, it should consist of farinaceous food, such as rice, bran bread, light, baked puddings, cream, toast of rye bread, together with rye mush and milk, soft, stewed fruit, baked apples, etc. The meals should be taken at regular intervals, and in moderate quantities. The mind should be kept cheerful, and the body frequently sponged with salt water, followed by brisk friction. Out-door exercise is also indispensable in the management of this disease. To assist in the removal

of the inflammation, ten drops of the tincture of bryonia may be added to six ounces of water, and one teaspoonful administered every half hour or hour. This may be alternated with one or two grains of frazerin. In case there is ulceration, from one-half to one grain of muriate of hydrastia may be administered four or five times a day. Where there is much prostration of the nervous system, and the disease is of long duration, one or two drops of the fluid extract of nux vomica, administered in a wine-glass of water, frequently proves of the greatest service. Where the inflammation is produced by congestion of the portal circle, one-half grain of fel bovinum, and one grain of leontodin, administered once or twice a day, will usually remove the difficulty. If there be thickening of the mucous membrane, one dram of chlorate of potash, dissolved in six ounces of water, and one teaspoonful administered once or twice a day, will prove of benefit. Where there are indications of granulation, rhusin and myricin are the remedies.

A medical friend states to me that he has been very successful in the treatment of chronic gastritis, by administering five or ten drops of the fluid extract of staphyleaceæ four or five times a day. The bowels, if constipated, may be occasionally opened by means of small doses of the compound syrup of rhei et potassa. Chafing liniments applied to the epigastrium, may also prove serviceable. Five or ten grains of chloride of soda, dissolved in a tumbler of water, and drank every morning before breakfast, has cured some inveterate cases of gastritis.

A friend of mine, who had been troubled for years with chronic gastritis, effectually cured himself by eating fresh, ripe grapes. His practice was to eat about one pound a day.

All stimulating drinks, patent medicines, and every thing that tends to irritate the stomach, should be carefully avoided.

INDURATION OF THE STOMACH.

Induration consists in a morbid fibrous transformation of the submucous tissue, by which the thickness and firmness of the stomach are increased. This condition is produced by a transformation of the exudation into fibrous tissue, the result of chronic inflammation. The morbid change may be very extensive, involving the whole organ, or only a limited portion. If the latter, the pylo-

ric extremity is apt to be the seat. The danger depends on the extent and situation of the growth. If the transformation be extensive, the stomach cannot dilate properly, and thus a sufficient quantity of food is not digested. If the pylorus be involved, it causes stricture at this outlet. The existence of induration is not marked by any distinctive symptoms. Vomiting is very frequent, if there be obstruction of the pylorus. The cause of death, in these cases, is inanition. This affection occurs very rarely, and is chiefly confined to those of intemperate habits. When there are vomiting of accumulated ingesta and dilatation of the stomach, induration may be suspected at the pylorus. If there be no pyloric obstruction, the *diagnosis* may be difficult.

Treatment.—When it is known that induration exists, it may be overcome by administering small doses of muriate of ammonia, podophyllin, and xanthoxylin. This may be repeated until slight ptyalism is produced.

SOFTENING OF THE STOMACH.

Softening of the stomach may be limited to the mucous membrane, or may extend to the other tissues. When only exhibited in the mucous tunic, the walls of the organ are thinned, the coat cannot be removed in strips, but may be easily scraped away, and in some cases the membrane is converted into a pulpy mass, (Pultaceous softening.) It is more likely to occur at the cardiac than at the pyloric portion, but may extend even to the duodenum. The gastric juice may regurgitate into the œsophagus, and produce inflammation and perforation. The softened parts of the stomach are white, or of a bluish-white, if the blood-vessels be empty; but if not, the tissues are of a darkish color. They have an acid reaction, and are entirely free from a putrefactious odor.

Causes.—Softening of the mucous membrane of the stomach, is usually the result of chronic inflammation.

Symptoms.—In case of softening, the only peculiar diagnostic symptom of the condition is the inability of the stomach to digest even the simplest kinds of food. The food produces great distress, and after remaining in the stomach for a short time, is usually rejected, without undergoing any other change than that of partial putrefaction.

Treatment.—The treatment of softening of the stomach, is essentially the same as that of chronic gastritis, with the addition of small doses of capsicum, rhusin, and frazerin, administered in cream three or four times a day. Liberal draughts of a cold infusion of verbascum thapsus, have also been highly recommended for this condition of the stomach. Chlorate of potash, in connection with the essential tincture of hydrastis Canadensis, is also a very valuable remedy.

ULCERATION OF THE STOMACH.

Gastric ulcer is not an uncommon disease. It is much more frequent in women than in men, and chiefly occurs in middle and advanced life. The ulcer is generally solitary, but there may be more than one; and in such cases they are mostly seated in the posterior wall, the small curvature, and near the pylorus. They vary in size, sometimes being so minute as to be scarcely discernible, or they may be as large as a dollar, or even considerably larger. Usually they are oval or circular, with thickened and hardened borders, sloping edges, and a gray surface. The mucous membrane around them is generally inflamed. Commencing in this tunic, they gradually extend through the different tissues, and not uncommonly reach the peritoneum. Perforation may then ensue, either from sloughing or rupture of the peritoneal coat. But provision is often made against this condition by adhesion between the stomach and some adjacent structures, as the liver, pancreas, colon, diaphragm, and duodenum. In the cases of the colon and the duodenum, the coats may be perforated, and a connection formed between them and the stomach, constituting gastro-colic fistula. Sometimes, when no adhesions occur, the contents of the stomach are effused into the abdominal cavity, producing fatal peritonitis. Dr. Brinton's researches show that adhesions occur in about forty per cent. of the cases, and perforation in thirteen.

Hemorrhage, another alarming result of ulceration, comes either from the capillaries of the diseased portion, the vessels of the penetrated viscera, or the large arteries, of which the splenic and coronary are the most dangerous.

Symptoms.—The most prominent diagnostic symptoms are pain, tenderness on pressure, vomiting, and hemorrhage. The pain is

seldom absent, and is variously described as burning, gnawing, pinching, or cutting, coming on almost immediately after eating, and continuing until the stomach is emptied. It is generally felt at the epigastrium, although sometimes a similar gnawing pain is experienced in the back, between the shoulders. Tenderness on pressure is invariably present in both cases.

Vomiting is a constant symptom, almost every thing that is eaten being rejected. It depends much on the quantity and kind of food however, being more easily provoked by indigestible and stimulating diet. Generally after eating, there is not only pain, but an intolerable sense of weight and oppression, which induces the sufferer to favor this vomiting. Soon after the ulcer is formed, the vomited matter becomes mixed with blood, which is frequently dark or grumous from the action of the gastric juice. The hemorrhage is generally slight, although it may sometimes be very copious, producing great prostration, or even death. It generally comes on after eating. In some rare cases death has resulted from hemorrhage into the stomach, without vomiting. Constipation is generally present, although the hemorrhage sometimes produces diarrhœa, accompanied with black stools. There is great emaciation and anæmia. In the female, amenorrhœa is common.

Pathology.—The pathology of ulceration of the stomach is very obscure. Whether it be due to non-inflammatory degeneration, or an inflammatory process, it commences usually on the mucous membrane, and involves the entire structure of the organ. It has been ascribed to the action of the gastric juice. Exclusive of the perforating ulcer, it occurs chiefly in persons of advanced life, although all are liable to it after puberty. In those whose systems are debilitated by an improper and injudicious diet, it is more apt to be observed.

The *diagnosis* of ulceration of the stomach can always be made with certainty, if the symptoms above described be present. Similar symptoms may also occur in carcinoma; but there are different phenomena which characterize the latter affection, which we will notice under the head of cancer. In the chronic form of gastritis, the symptoms are somewhat analogous to those of gastric ulcer, but the pain is less prominent, vomiting does not occur as frequently and hemorrhage is wanting.

Prognosis.—There is nothing malignant in the character of these ulcers, and the prognosis is generally favorable when the patient is placed under proper treatment. There is danger, however, of hemorrhage and perforation in all cases; but they can always be averted, if care be taken. The tendency of the ulcers is to heal; and they will generally do so, unless prevented by mechanical or irritant causes. Even after cicatrization has taken place, the ulceration may return. When the ulcer is seated on the pyloric orifice, it may lead to stricture.

Treatment.—In addition to the treatment which is necessary in chronic inflammation, regulating the diet, etc., small doses of muriate of hydrastia, in combination with chlorate of potash, will usually have a most beneficial influence. Two or three drops of bryonia, administered three or four times a day, have also proved successful. When the ulcers have a tendency to become malignant, ten drops of creasote may be added to six ounces of water, and a teaspoonful administered four or five times a day, in connection with one or two grains of myricin.

I once cured a bad case of ulceration of the stomach, by administering one fluidram of the essential tincture of rhus glabra, one-half hour previously to each meal, and before retiring. Dr. Dunglison, of this city, prescribes small doses of carbo ligni in a teaspoonful of yeast, four or five times a day. Mucilaginous drinks, such as althæ officinalis, ulmus fulva, and flaxseed, will also be beneficial.

In some malignant cases, the one-sixteenth of a grain of argenti nitras, administered in one or two fluidounces of gum water, has proved a most potent remedy. Small doses of sub-nitrate of bismuth have also been used with benefit in these cases. In the management of ulcerated stomachs, it must be remembered that the cure depends much upon a well-regulated diet, pure air, and rest.

DILATATION OF THE STOMACH.

Dilatation is a condition usually dependent upon obstruction at the pyloric orifice. The capacity of the stomach increases to such an extent, as to contain several gallons of liquid. In such cases, there are thinness and atrophy of the coats of the stomach.

Symptoms.—Vomiting frequently occurs, consisting mostly of im-

perfectly digested food, of a putrescent odor, containing sarcinæ and torulæ cerevisiæ. The appetite is good, or even ravenous; but, owing to the accumulation of food in the stomach, assimilation is imperfect, and the body emaciated. This dilatation is aggravated by immoderate eating, paralysis of the stomach, and atrophy of the muscular fibres, which occur during the progress of the disease. These conditions are indicated by the prominence of the abdomen, especially at the epigastrium. The upper portion of the tumor yields a tympanitic sound on percussion; and the lower, flatness. If the stomach contain ingesta, the situation of the sounds changes according to the position of the patient. A splashing sound may also be produced by full inspiration. The enlargement varies according to the severity of the disease.

A case which occurred in my practice was that of a German, who was an habitual lager beer drinker, and from his statement he frequently drank from four to five quarts of the liquid in twenty-four hours. He complained of much cardiac irritation, irregular action of the heart, vertigo, and a sense of great fulness about the epigastrium. The prominence of the stomach in the left portion of the epigastrium, the dulness upon percussion, and great arterial excitement upon taking exercise, had led several physicians to diagnose the case as aneurism of the aorta, or some of its branches. This patient had been treated in one of our hospitals, and the physician in charge had ordered him to abstain entirely from exercise, as there was eminent danger of rupture and death. After he had been carried through the wards of the hospital in an arm-chair for several months, he was removed by his friends, and placed under my charge. The capacity of the stomach to hold fluids, the morbid appetite, the variation of resonance upon percussion, caused by a change of position, the increase of dimensions of the larger curvature, the pressure of the stomach upon the diaphragm, its encroachment upon the heart, together with the fact that when the stomach was empty, there was an extensive gurgling sound, proved that he was laboring under dilatation of the stomach. This patient, by a well-regulated diet, proper exercise, and the liberal use of stomachics, soon recovered.

Treatment.—In dilatation of the stomach, the cause of the disease, as far as practicable, should be removed, and a most thorough

dietetic and hygienic course instituted. The remedies adapted to these cases are alnuin, frazerin, the preparations of hydrastis, and general tonics.

I have used a decoction of the bark of the populus tremuloides with much success. A medical friend writes me that he has used the pyruscin to advantage in these cases.

CARCINOMA OF THE STOMACH.

The stomach is frequently the seat of cancer, in its various forms. It may appear in any portion of its structure, but most frequently in the pyloric or cardiac extremity. It may be of a scirrhous, colloid, or encephaloid character, generally that of the former, and may pass on rapidly, terminating in a few months, or progress steadily for several years, and then end fatally.

Symptoms.—The early symptoms of cancer of the stomach, are usually very similar to those of chronic gastritis; there is impaired appetite, or anorexia, nausea, and vomiting. There is pain of a lancinating character in the region of the stomach, and along the spine. There may be a gnawing pain, as in ulcer, and in these cases the ulcer may have occurred as secondary to the cancer. There may or may not be tenderness over the epigastrium. Vomiting occurs less frequently than in cases of simple ulcer, and at a later period after taking food. It is a glairy mucus early in the disease, but later it becomes sour, purulent, and finally bloody, and filled with cancer cells. There are, in addition to these symptoms, a loss of strength and weight, anæmia, febrile excitement, constipation, and occasionally diarrhœa or jaundice. The complexion has a peculiar yellowish-white, waxen appearance, which is not often observed in other diseases. But the most certain diagnostic symptom is the tumor. This is discovered at various periods in the progress of the disease, and is most easily perceived when in the pylorus, or great curvature of the stomach.

Anatomical Characters.—The stomach may be much enlarged or contracted, and its coats thickened. The interior surface is usually covered with a brown mucus. The appearances vary with the period at which the patient dies, and with the character of the cancer. If ulceration has not occurred, the coats of the stomach are whitish, indurated, and semi-cartilaginous. The disease may be

confined to the mucous membrane, or involve the submucous cellular tissue, and even the muscular and peritoneal coats. Instead of the tumor being white and indurated, it may be of a soft or brain-like consistence, constituting medullary cancer; or it may consist of cells, filled with a gelatinous deposit, separated by fibrous partitions, constituting the colloid variety. In very advanced stages, ulcers are found in different forms of their progress, the peritoneal coat in such cases having often contracted adhesions with the pancreas, spleen, liver, etc.

Cause.—There is evidently an hereditary predisposition to carcinoma in some constitutions; but in what it consists, is not certain. The exciting causes are excesses in eating, indigestible food, alcoholic liquors, stimulating medicines, depressing mental emotions, excessive venery, etc.

Diagnosis.—Carcinoma of the stomach is distinguished from chronic gastric ulcer by the cachectic countenance, the tumor, the spinal pain, the obstinate vomitings; and in the ulcerative stage, by the presence of cancerous cells in the matter ejected.

The *prognosis* is generally unfavorable.

Treatment.—The treatment consists principally in combating the urgent symptoms, as they present themselves. There are but few remedies that can be administered with any hope of success, and even these may not produce any radical impression upon the malady. The remedies that have been supposed to produce favorable results in cancerous affections of the stomach, are sulphuric and nitric acid, and the various preparations of arsenic.

As I have already stated, in speaking of cancerous affections of the œsophagus, I cured what was supposed to be a cancerous disorder with Donovan's solution. This may be tried as directed under the head of cancer of the œsophagus. If that should fail, from two to five drops of nitric acid may be administered four or five times a day; and when there is an open cancer, connected with vomiting, even ten or fifteen drops, every two or three hours, have been recommended. Nitric acid may be alternated with sulphuric. It has been suggested that permanganate of potash, in doses of one-fourth or one-eighth of a grain, administered four or five times a day, will produce a palliative influence upon the disease.

CARDIALGIA.

Cardialgia, or heart-burn, presents itself in two forms. It is usually attended by acid or acrid eructations, causing irritation in the throat and fauces. This acidity sometimes occasions very unpleasant sensations in the mouth and pharynx, followed by a copious flow of saliva. At other times, matter ejected from the stomach is rancid and alkaline, connected with an unpleasant gnawing and burning pain, with tenderness and distention at the epigastrium, and oppression of the chest. It principally occurs during the digestive process. It may exist in a mild form, or be severe, the uneasiness extending over the region of the stomach, attended by depression, anxiety of countenance, and faintness. It is caused by the generation of gases in the stomach, or the accumulation of an excess of acid. It may also be produced by irritating ingesta, and frequently accompanies chronic inflammation.

Treatment.—When cardialgia is an accompaniment of other disorders of the stomach, it will disappear when the cause is removed. If produced by the generation of gas during the process of digestion, it can be removed by administering five or ten grains of pulverized charcoal, and an equal quantity of carbonate of magnesia. I have also frequently relieved this symptom by giving a fluidram of the compound syrup of rhei et potassa. It will also be relieved by fifteen or twenty drops of compound spirits of lavender. When the eructation is of an alkaline character, a dram of the syrup of lemon, administered occasionally, will afford relief.

GASTRALGIA, OR GASTRODYNIA.

Gastralgia, or gastrodynia, is a neuralgic affection of the stomach, closely allied to dyspepsia, and in some instances appears as one of its symptoms. Sometimes the appetite remains good, but generally it is impaired. There is a gnawing pain in the stomach, extending to the back, accompanied with anxiety and sense of constriction, and a strong tendency to vomit. There is constipation, intense thirst, and more or less pain in the head. It may be attended with dyspnœa, palpitation, restlessness, morbid vigilance, depression of spirits, etc. The tongue is not unfrequently healthy,

the skin cool, and the pulse quite undisturbed. The pain is intermittent.

Causes.—The principal causes of this disease are the long-continued use of indigestible food, very warm or cold drinks, or the use of alcoholic liquors, scirrhous and cancerous affections of the stomach, etc. It may also proceed from disease of the spinal marrow or sympathetic nerve, gout, and rheumatism. Anæmic and hysterical females are very subject to it.

Treatment.—Gastrodynia is amenable to the same treatment as other neuralgic affections. Usually fifteen or twenty grains of sulphate of quinine, combined with one dram of prussiate of iron, divided into ten powders, administered every three hours, will arrest the difficulty. When the disease is connected with a vitiated condition of the system, a tonic and invigorating constitutional treatment should follow the antiperiodic course. Temporary relief can be obtained by giving five drops of equal parts of chloroform and aconite. When connected with hyperæsthesia of the nervous system generally, small doses of aconitin and cypripedin may be given.

GASTRORRHŒA, OR CATARRH OF THE STOMACH.

Gastrorrhœa is a morbid condition of the stomach, characterized by an excessive discharge of an albuminous fluid, insipid and inodorous. The vomiting generally occurs in the morning, but may take place at any time. In some cases, it is little more than a form of regurgitation, and seldom severe.

This disease probably originates in an inflammatory condition of the mucous membrane; is often very mild, but may run a long course, and end fatally, especially in the aged.

Treatment.—The treatment for gastrorrhœa is essentially the same as that of chronic inflammation, of which it is usually an accompaniment. After the inflammatory condition has been removed, if the exudation and vomiting should continue, small doses of geranin and alnuin will usually arrest it.

SPASM OF THE STOMACH.

Spasm of the stomach consists of a sense of pain, stricture, or contraction in the epigastrium, occurring in paroxysms. The stomach sometimes feels as though gathered into a ball, or drawn to-

wards the back. It may be confined to a portion of the stomach, or diffused over the entire organ, and extend to the breast, when the œsophagus is involved. The patient generally assumes a recumbent position during the paroxysm, and attempts to relieve the pain by pressure. After the spasm has subsided, the stomach is sore and tender to external pressure. The pain varies from a slight fugitive affection to a most violent one. This is another form of neuralgia, and partakes much of the nature of bilious colic.

Treatment.—This disease is almost instantly relieved by one or two grains of dioscorin, and an eighth to a fourth of a grain of gelsemin. If the first dose does not afford relief, it may be repeated in half an hour.

PYROSIS.

Pyrosis, or water-brash, occurs generally in paroxysms. It commences with constriction and pain at the pit of the stomach, which is increased in assuming the erect posture. The pain is sometimes very intense, and of a burning character. An eructation of a thin, insipid, watery liquid is discharged, although sometimes it is sour or acrid. As soon as this discharge commences, the pain gradually subsides. The attacks usually occur when the stomach is empty.

Its cause is not well understood. It appears most frequently among those who are meagerly fed, and who indulge in stimulating beverages. It is more common in women than men, and seldom occurs before the age of puberty, or in old people. It may be produced by any thing calculated to disturb the stomach, as pregnancy, anxiety of mind, etc.

As to the nature of the affection, we may infer that it is a combination of gastralgia with vascular irritation of the mucous membrane, occurring paroxysmally, and being relieved by a copious eructation of fluid from the exhalent vessels of the stomach. The pain is not produced by the fluid, but relieved by it.

Treatment.—Quinine, sulphate of soda, chlorate of potash, iron, and general tonics, will usually remove this difficulty.

DYSPEPSIA, OR INDIGESTION.

Dyspepsia is one of the most common diseases with which we

meet; but in order to understand its character, nature or cause, we must first take a glance at the process of digestion.

In healthy digestion, the food must be of a proper quality, taken at regular intervals, thoroughly masticated and moistened with saliva, before passing into the stomach. The stomach must contain sufficient gastric juice to convert it into chyme. It is then carried by the muscular coat through the pylorus into the duodenum, where it is mixed with bile, the pancreatic juice, and the intestinal mucus, and changed to a milky substance, or chyle. From the duodenum, it is taken up by the absorbents, and conveyed to the *receptaculum chyli*, and by the thoracic tube to the left subclavian vein, where it enters the general circulation. The excrementitious matter is expelled by the peristaltic function of the bowels. The mesenteric glands through which the lacteals pass, must be in a healthy state, so as to aid in converting the fat and albumen of the chyle into blood. Any deviation from this process of digestion, no matter how trifling, if continued for any length of time, will produce dyspepsia in some form.

Symptoms.—In simple indigestion, the symptoms vary much in nature and severity; one individual may suffer severely, while another has merely slight depression of spirits. In the chronic cases, there is anorexia, or loss of appetite, nausea, vomiting, inflatio, ructus, constipation, alternating with diarrhœa, furred tongue, foulness of breath, palpitation of the heart, pains and aching in the loins and limbs, dull headache, and hypochondriasis. Occasionally the patient complains of gastrodynia, or cramp of the stomach, cardialgia or heart-burn, gastralgia, or pyrosis or water-brash. The first of these symptoms, anorexia, want of the natural appetite, is sometimes almost the only observable one. The patient is warned by loss of appetite not to take too much food; he refrains from certain articles of diet, or he may have a great repugnance and disgust at the very thought of eating. In other cases, the appetite is morbid and ravenous, or capricious and uncertain. There is seldom a healthy feeling of hunger; but in place of this, the patient may commonly experience a sensation of hollowness or sinking at the epigastrium, when the stomach is empty, which leads him to wish for food. Thirst is not frequent.

Nausea and vomiting are sometimes the most distressing signs

of dyspepsia. The former, at times, occurs soon after the food is swallowed, or may be deferred for an hour or two. The matter ejected is most frequently sour, and sometimes mixed with bile. Flatulence and belching may exist as the result of gas formed from the indigested food. When the regurgitation is attended with the odor and flavor of rotten eggs; or, in other words, when the gas evolved is sulphuretted hydrogen, it results from decomposition of the albuminous contents of the stomach. The patient is said to ruminate, when the ascending gas brings into the throat and mouth a portion of the solid contents of the stomach. These regurgitations are often intensely sour, from the presence of either lactic, acetic, or hydrochloric acid. When they occur during the progress of digestion, the acidity is probably due to chemical changes in the food; but when it occurs after long fasting, it proceeds from the gastric glands. Indigestion is, in many instances, attended with scarcely any *pain*, while in others it is very annoying. Some persons suffer pain, occasionally, when the stomach is empty, even when there is no flatulence, and they are comforted and relieved after eating. This species of pain, or cardialgia, is accompanied by a slow pulse. Another form is when it occurs immediately after taking food, and continues during the digestive process, or until vomiting ensues. When this form exists, we may suspect chronic inflammation, ulceration, or some morbid condition of the mucous membrane. When there is a feeling of uneasiness after eating, with a sense of weight at the pit of the stomach, and indisposition to exertion, we may infer that the digestion is slow and difficult, owing to a scanty secretion of the gastric juice.

In another variety of painful disorder of the stomach, it does not commence until from two to four hours after a meal, and continues for several hours. This is a very common complaint, and dependent upon fermentation in the *primæ viæ*. When the pain occurs at uncertain intervals, and in most violent paroxysms, it is styled gastrodynia. It is frequently associated with a feeling of distention, anxiety, and great restlessness. It is more frequent in females, often combined with hysteria. It is not confined to the stomach, but shoots through to the back, and between the shoulders, being the result of over-distention of the stomach. Sometimes there is great suffering from this rapid development of tym-

panites, the abdomen becomes enormously distended, and the respiration impeded by interference with the descent of the diaphragm. In females, the suffering is increased by pressure upon the uterus and bladder. In gouty persons, there is sometimes *spasm* of the stomach, the pain coming on in sudden and severe paroxysms. Some patients are affected with pyrosis, or water-brash, an eructation of a thin watery fluid, resembling saliva, usually insipid, but sometimes sourish. It is more frequent in women than men.

Another form of disordered stomach, consists in the ejection of fluids of a faint acid odor, like that of fermenting wort. After standing a short time, they are covered with a thick, brownish, yeast-like froth, and deposit a brown flaky sediment, in which are seen great numbers of sarcinæ. The vomiting is generally copious. It takes place frequently in the morning, after a night of much suffering from burning and distention, and a feeling of bubbling and fermentation about the epigastrium. This form is usually indicative of some structural and incurable disease of the stomach.

The symptoms of mental disorder are the most noticeable except those directly referring to the stomach and small intestine. There is great languor, or drowsiness, sick headache, giddiness, heaviness of the head, confusion of thought, tinnitus aurium, muscæ volitantes, depression of spirits, indifference or anxiety, an indisposition to exertion, an irritable temper, fretfulness, the sleep is disturbed by unpleasant dreams, and the patient is apt to imagine himself affected with consumption, heart disease, etc. Palpitation of the heart, dyspnœa, and a dry cough, are sometimes present, which tend to confirm his impressions. The tongue is usually furred; there is an unpleasant taste in the mouth, and in some instances frequent hawking, with a discharge of frothy mucus from the fauces. Constipation is a very frequent concomitant, and sometimes diarrhœa is associated with dyspepsia. The liver is sometimes deranged. Occasionally the secretion of bile is diminished, giving rise to light clay-colored, whitish, or hard and scanty stools. The surface is generally dry, and of irregular temperature, excepting in debilitated cases, in which there is copious perspiration. In some instances, the pulse is quite natural; but at times, it is either too slow, frequent, or altogether irregular. The urine is scanty and high-colored, with a whitish or lateritious precipitate.

Dyspepsia is often connected with phthisis, leucorrhœa, amenorrhœa, and chlorosis. One of the worst occasional attendants of dyspepsia is hypochondriasis, a species of insanity. Patients are devoid of buoyancy, are gloomy, and apprehensive of the existence of some grave affection, such as phthisis or heart disease. They are constantly thinking of themselves, and watch the sensations connected with digestion, and fall into the habit of counting the pulse, feeling the beating of the heart, examining the tongue, abdomen, urine, etc.

The symptoms above enumerated, are by no means present in every case. This disease assumes an endless variety of forms, and there are scarcely two cases in which striking differences might not be observed.

Causes.—The causes of dyspepsia are various, but the most frequent are irregularity and imprudence in taking food, improper exercise, etc. Want of bodily exercise, excessive labor, undue intellectual exertion, mental anxiety, general debility, immoderate smoking, the excessive use of alcoholic liquors, opium, strong coffee, or tea, may cause dyspepsia. Morbid states of the brain, lungs, liver, or uterus, may, by reflex action, produce it, attended with most violent vomiting. It may be brought on by protracted hemorrhages, menorrhaghia, leucorrhœa, seminal weakness, and venereal excesses. Suppression of the natural excretions, or the retrocession of cutaneous eruptions, exposure to night air, etc., may be mentioned among its numerous causes. The period of life in which dyspepsia most frequently occurs, is between adult age and middle life.

Treatment.—The treatment of dyspepsia depends essentially upon the cause of the difficulty. Many of the forms we have already considered. Dyspepsia produced by bad habits, can only be corrected by a strict adherence to the physiological laws controlling the digestive functions. In fact, the great success of the treatment depends more upon hygea and dietetics, than the use of drugs. When it arises from inertia of the stomach, it may be removed by giving stomachics or stomach tonics, such as hydrastin; but when it occurs from softening of the mucous membrane, and deficiency of the gastric secretion, then alnuin is the remedy. When produced by hyperæmia, or chronic inflammation, chelonin is indicated. When

dependent upon nervous debility, it may usually be overcome by iron, strychnin, phosphorus, and cypripedin. When originating in constipation of the bowels, one-half grain of leptandrin, and one grain of fel bovinum, made in the form of a pill, administered three or four times a day, has been known to produce a speedy cure. An infusion of equal parts of chamomile flowers and balmony, drank freely three or four times a day, is also a valuable remedy in many cases of chronic dyspepsia. I have cured several inveterate cases of indigestion, by administering one-half dram of chloride of sodium, or common salt, in a tumbler of water, upon rising in the morning, and previously to each meal. Pipsin is another remedy that has been highly recommended in many cases, and under some circumstances may be very serviceable. Some physicians are in the habit of prescribing tonics, in connection with alcoholic stimulants, in the form of bitters. This practice is most pernicious; although in many cases it will afford temporary relief, and relieve the indigestion for a time, yet the ultimate effect is to debilitate the stomach, and produce chronic inflammation.

Fresh air, baths, friction, out-door exercise, a careful avoidance of overloading the stomach, with indigestible food, are indispensable in all forms of this affection.

Sub-nitrate of bismuth, and chlorate of potash, are remedies that have also found much favor in the treatment of many forms of dyspepsia. I have cured a large number of inveterate cases produced by softening of the mucous membrane of the stomach, by administering one or two grains of frazerin four or five times a day, in connection with such constitutional treatment as the complications indicated.

DISEASES OF THE LIVER.

There is, perhaps, no organ in the body, whose anatomical character and function have been more carefully studied than that of the liver. This has arisen, in part, from the important relation it holds to the digestive apparatus, and to the supposition entertained by both ancient and modern practitioners, that whatever malady affected the human organism, the liver participated largely in the difficulty.

Nothing is more common, at this time, than to hear physicians

attribute all the common maladies and indispositions of their patients to a derangement of the liver. In fact, it is supposed to be an ample apology for the doctor's ignorance to denominate the case "a bilious affection." This universal hepatic pathology has had its corresponding therapeutics; hence, blue mass, a calomel pill, or a mercurial purge, is the universal panacea with a certain class of practitioners. Notwithstanding these absurd notions and extravagant methods of treatment, the liver is liable to a variety of disorders, and, when affected, exerts a marked influence on the organs and tissues of the body. One of its most common affections is hepatitis.

HEPATITIS.

Hepatitis, or inflammation of the liver, may be confined to the peritoneal covering, or involve the entire substance. It is, in many instances, a difficult matter to decide whether it involves the structure of the liver, or is confined to its covering. This, we think, however, can usually be determined by a careful analysis of the symptoms. If the inflammation be confined to the peritoneum, there will be a sharp, acute pain, which is aggravated by deep inspiration; but there is no increase of dulness on percussion, nor is there hypertrophy or enlargement. If it be extensive, it is usually connected with a short, irritable cough, a pleuritic pain, and a symptomatic one in the left shoulder. If it extend to the substance of the liver, it is soon manifested by an increase of bulk, a marked derangement of its function, and a more extensive constitutional disturbance. The season and climate, also, contribute much to a correct diagnosis, as inflammation of the substance of the liver seldom appears, only in tropical climates, or in a temperate during the hot season, while peritoneal inflammation occurs in cold climates, and in all seasons. Again, the character of the pain may serve as an important diagnostic symptom; as the pain connected with the inflammation of the substance of the liver is of a dull or heavy aching character, while that connected with its membrane is acute and harassing. Inflammation of the membrane, or substance of the liver, may terminate either in resolution, chronic inflammation, or suppuration. Where it terminates in resolution, the symptoms gradually subside,

and the organ is restored to its natural function. When it terminates in chronic inflammation, there is usually more or less hypertrophy, or enlargement of the liver, which is indicated by increased dulness upon percussion, and the extension of the liver beyond its normal boundary. Either acute or chronic inflammation may result in a series of pathological conditions, which are considered under the heads of hypertrophy, atrophy, cirrhosis, nutmeg liver, etc. All these conditions are the result of morphological changes, occurring in the exudation during the inflammatory process. These pathological conditions depend upon the character and extent of the inflammatory action, together with the associated constitutional cachexia, which shapes the type of the abnormal products. It must be remembered that the natural transformation of the exudation in parenchymatous organs, is that of granular degeneration, and that if there is feeble vitality, tuberculous degeneration is the result.

Symptoms.—Acute hepatitis usually makes its appearance suddenly, with considerable violence, particularly in marshy or miasmatic localities. The disease commences generally with chills, and a pain in the right hypochondrium, accompanied with a sensation of tightness across the abdomen, some difficulty in breathing, and a disinclination to the recumbent position, the patient feeling the easiest while sitting. Then, as the morbid action increases, there is high fever, with hot skin, thirst, and scanty urine, occasionally a yellow tinge of the conjunctiva, but rarely complete jaundice, dyspnœa, a sympathetic cough, vomiting, and troublesome hiccough. The right clavicle, breast and shoulders often become the seat of gnawing and aching pains. The brain may sympathize with the liver, causing slight mental disturbance.

The acute form rarely continues beyond the seventh day, without terminating in resolution or suppuration. In the latter event, there are a sallow and dingy appearance of the skin, nausea, and sometimes vomiting, anorexia, high-colored urine, hectic fever, dull, aching pain, and great tenderness over the region of the abscess.

A case occurred in my practice, in which acute hepatitis terminated in suppuration, involving nearly one-half of the liver. I opened the abscess by dissecting through the parietes of the abdomen, and evacuated upwards of one quart of pus; after which, the case rapidly recovered.

It may also terminate in gangrene, or abscesses may form in different portions of the organ.

Causes.—Among the most common causes are atmospheric vicissitudes, intoxicating liquors, tobacco, high living, sedentary habits, violent exercise, injuries of the right hypochondrium, wounds of the head, the passages of biliary calculi, the habitual use of mercury, the retrocession of gout or rheumatism, the suppression of hemorrhoids, terror, mental despondency, etc.

Diagnosis.—Hepatitis may be confounded with pleurisy, pneumonia, gastritis, or with the passage of the biliary concretions. In *pleurisy*, the cough and oppression in the chest are more severe; the patient, usually, lies on the affected side, and tenderness is felt in the intercostal spaces, while, in hepatitis, he lies on the well side, and the tenderness is in the epigastrium or right hypochondrium. In *pneumonia*, the respiration is performed chiefly by the abdominal muscles, while, in hepatitis, by the intercostal.

From *gastritis*, this disease may be distinguished by the full, hard pulse. In gastritis, there is considerable prostration from the first, and obstinate vomiting on taking any thing into the stomach, while, in hepatitis, the vomiting is not so constant, and the prostration is not so great at the commencement. It may be distinguished from the *passage* of *gall stones*, by the fever, the continuous pain, and by the position of the patient, in hepatitis the patient inclining a little forward and to the right side; while, in the passage of biliary concretions, he is easiest when the body is bent forward on the pelvis.

Anatomical Characters.—When the peritoneal coat has been involved, it is found red, more vascular, and perhaps thickened, and may be covered with coagulable lymph. If the parenchyma has been inflamed, it may be congested with blood, enlarged and softer than in health; and on being cut, an oozing of blood may occur, which appears to have occupied small cavities in the substance of the gland. In an advanced stage, abscesses are found occupying the substance or surface of the liver. When the abscess occurs in the former, it contains a sero-purulent fluid, mixed with the softened matter of the gland, and its surrounding tissue is more vascular. Only one abscess may be found, or they may exist in great numbers. The pus may appear quite natural, if it only occupies the

surface of the gland, but is apt to be of a reddish, green or dark color, being mixed with bile, and, more or less, of the disorganized tissue of the gland.

Treatment.—The treatment of acute hepatitis consists in equalizing the circulation, producing gentle perspiration, evacuating the bowels and stomach, and the local application of hot packs. The stomach, under ordinary circumstances, should be thoroughly evacuated by a lobelia emetic, followed by a gentle purge, to open the bowels. Equal parts of the neutralizing cordial and fluid extract of leptandria virginica, answer this purpose very well. To control the circulation, veratrin, or the tincture of veratrum viride, should be administered. Hot packs should be applied over the right hypochondrium, extending to the epigastrium, and changed frequently during the active inflammation. As this is mostly a disease of hot climates, and associated with malarial affections, it will be necessary to follow the treatment already described with quinine and iron.

If the inflammation involve the parenchyma of the liver, gelsemin and sulphur are indicated, in the proportion of one grain of the latter, and from one-tenth to one-eighth of a grain of the former, administered every two or three hours. If the inflammation be confined to the peritoneal structure, jalapin, colocynthin, and irisin, are the remedies. Five or ten grains of the triturated of one of the above articles, may be added to a tumbler of water, and a teaspoonful administered every ten or fifteen minutes. The diet should be light, composed mostly of farinaceous broths, the patient being kept quiet in bed. All purgatives and hepatic stimulants, such as the mercurials, podophyllin, etc., only have a tendency to aggravate this difficulty in the acute form, consequently they should not be administered. The terminations of acute inflammation into the chronic form, the formations of abscesses, together with the various alterations of structure, are considered under their respective heads.

CHRONIC HEPATITIS.

Chronic hepatitis may be confined to the peritoneal structure of the liver, but more usually involves the entire organ. It may be the result of the acute form, although it exists independently of the active inflammatory process. When it manifests itself as a chronic inflammation, it is a very insidious disease, and becomes

far advanced previously to attracting any special attention. Chronic inflammation of the substance of the liver produces a great variety of pathological conditions, such as the formation of abscesses, hypertrophy and atrophy, granular degeneration, and in some constitutions, malignant structures. If the inflammation be confined to the peritoneal tissue, the exudation may be converted into pus, forming superficial abscesses, or become organized, and permanently attached to the parenchyma, or the exudation may accumulate in patches beneath the peritoneal coating, undergo granular or tuberculous degeneration, constituting the various forms of nutmeg liver. These transformations in the structure of the organ, as well as in the product of inflammation, depend upon the causes producing the disease, the dyscrasia of the blood at the time of the inflammatory action, and the peculiar constitutional cachexia. Thus, if parenchymatous chronic inflammation be produced by the excessive use of alcoholic or malt liquors in a person of a scrofulous constitution, and a feeble state of the blood, the exudation will percolate, the cellular tissue undergo granular degeneration, resulting in cirrhosis; or tuberculous degeneration of the exudation may occur, producing this condition of the liver.

Symptoms.—The symptoms of chronic hepatitis are disordered stomach, occasional vomiting, irregular bowels, unhealthy alvine evacuations, a bitter or disagreeable taste, a furred tongue, a turbid or jaundiced appearance of the eyes and skin, a harsh, dry surface, high-colored, bilious and acrid urine, a short, dry cough, depression of spirits, slight febrile excitement towards night, and general emaciation.

Causes.—Heat, or atmospheric vicissitudes, the paludal poison, intoxicating liquors, tobacco, and various abuses of the system, such as masturbation, excessive venery, etc., direct injuries, the metastasis of gout or rheumatism, the constant use of mercurials, or other hepatic stimulants, or it may be the result of the acute form, or arise from the suppression of the hemorrhoidal, or other accustomed discharges.

Anatomical Characters.—Various appearances are presented, viz., induration, softening, suppuration, etc. Partial or general softening is a much more frequent condition than induration. The portion involved is generally of a dark-reddish color. It may be

only slightly softened, or be reduced to a mere pulp, or a portion of it at least. Abscesses are often found.

Hypertrophy, atrophy, obliteration of the hepatic cells, together with various forms of degeneration of tissue, may be observed as the result of chronic hepatitis.

Treatment.—The treatment for chronic hepatitis consists in removing the cause, as far as practicable, and the application of an irritating plaster over the liver, which should be maintained until free pustulation is produced. The surface should be bathed in hot soda water, once or twice a day, and the diet be mostly composed of fresh vegetables. Alcoholic stimulants, tobacco, tea and coffee should be prohibited. The bowels should be kept open by means of small doses of sulphate of soda. In malarial districts, quinine, iron, and leptandrin should be administered in liberal quantities. If there is fever, it should be controlled by veratrin; the system should be supported by tonics, such as chelone glabra, populus tremuloides, and liriodendron tulipifera. The fluid extracts or decoctions of these articles may be administered in such quantities as to maintain a gentle excitement upon the liver, and give tone and vigor to the system generally. Diuretics will also be found serviceable, especially when the system is depressed from the accumulation of zymotic matter in the blood. Vegetable acids also prove beneficial, especially that of cider; and I have known great benefit to follow the use of vegetable tonics and iron, tinctured, in this article, and administered liberally.

CONGESTION OF THE LIVER.

The simplest form of congestion of the liver, is that which results from some obstruction of the circulation through the hepatic and portal veins. This mostly depends upon various organic affections of the heart, especially diseases of the mitral and tricuspid valves. Diseases of the pulmonary apparatus, where it interferes with the circulation of blood through the pulmonary organs, may also give rise to hepatic congestion. Hepatic congestion may also occur, as the result of violent exercise after a hearty meal. Congestion of the liver may be of an active or passive character. The passive form, as we have already described, is that which involves the circulation through the hepatic and portal vessels; whilst the active

includes hyperæmia of the capillaries of the hepatic artery. This form is mostly produced by such causes as induce abnormal activity of the organ. Dr. Tanner remarks, that passive congestion usually leads to a diminished secretion of bile, the secreting cells remaining active, but the passage of the bile from the lobules and through the small gall-ducts being delayed, owing to the compression which is exerted by the loaded vessels.

Symptoms.—The symptoms of *passive* congestion are a sense of constriction and weight in the right hypochondrium, usually connected with more or less yellowness of the conjunctiva; the urine is scanty and high-colored, and contains bile pigments and traces of albumen. There are constipation of the bowels, capricious appetite, and sometimes nausea and vomiting. The patient usually complains of headache, and the temper becomes irritable. In the *active* form of hyperæmia of the liver, a similar class of symptoms is manifested, but in an aggravated degree. Upon percussion, the area of dulness is increased, and, by pressure, more or less tenderness will be experienced. If the disease be associated with cardiac affections, it usually terminates in dropsy and death; or, if connected with pulmonary diseases, it constitutes a very unpleasant combination. The active form of congestion of the liver is usually associated with obstinate constipation, while the passive may give rise to congestion or inflammation of the hemorrhoidal veins, inflammation of the rectum, and dysentery.

Causes.—The causes of congestion of the liver are essentially the same as those which we have enumerated under the heads of chronic and acute inflammation.

Treatment.—The treatment consists in removing the causes, regulating the diet, out-door exercise, the liberal use of baths, and chafing liniments over the liver. The bowels should be opened by giving tablespoonful doses, of equal parts, of neutralizing mixture, and fluid extract of leptandria virginica, every hour or two. In the active form of the disease, the purge should be followed by one-tenth of a grain of gelsemin and one or two grains of sulphate of quinia, every three or four hours, until fifteen or twenty doses have been taken. This may be followed by small doses, of equal parts, of leontodin and leptandrin, four or five times a day; also, a table-

spoonful of the following mixture every morning:—Take sodæ sulphatis, four drams; aquæ menthæ piperitæ, four ounces. Mix.

In hot climates, gelsemin, leptandrin, leontodin and irisin may be given in such combinations as the cases may require. Mineral acids, especially the nitro-muriatic, will also prove beneficial in many of these cases. Sea bathing, Saratoga water, horse-back exercise, and mountain sports are also means to remove this form of disease of the liver.

CIRRHOSIS.

Induration of the liver or cirrhosis is the result of chronic inflammation of the areolar tissue of the entire organ. The inflammation which gives rise to this disease, results in a general hypertrophy of the connective tissue. It becomes abnormally firm, and ultimately so constricted as to diminish the caliber of the branches of the portal vein, hepatic artery, and duct. This diminished circulation results in a general atrophy of the lobular structure of the liver, and a fatty degeneration of the hepatic cells. This pathological condition of the liver interferes with the circulation of the blood through the portal vein, producing congestion and chronic inflammation of the gastric and intestinal mucous membrane; also, hyperæmia of the peritoneum, which gives rise to hemorrhages and ascites.

Causes.—The most common cause of cirrhosis is that of *rum drinking*, although it may be produced by other stimulants, as mercury, high-seasoned food, the use of tobacco, malaria and tropical climates.

Anatomical Characters.—Upon inspecting the liver, it will be found hard and indurated; the cellular tissues seem to form thin lines between the lobular structures and the parts on the surface corresponding to these constricted lobules, leaving the surface uneven; hence, it has been denominated *hob-nailed* by Drs. Morehead and Budd. The parenchyma is also paler than natural, although there may be an accumulation of bile in some portions of the liver, giving it a yellowish appearance. Fatty degeneration is also observable in different portions.

In a case examined, microscopically, by Dr. Bennett, he observed that the stroma of the organ was composed of fibrous sub-

stances, surrounding and compressing the hepatic lobules, many of which presented pale cells, more or less filled with yellow pigment. In some, the cells were, more or less, waxy, in others, fatty.

Symptoms.—The early symptoms are generally obscure; as soon, however, as the transformation of the exudation interferes with the circulation of the portal system, a deficiency of bile will be manifested in the alimentary canal, accompanied with constipation, a dry skin, high-colored urine, capricious appetite, and more or less irritability of the nervous system. There is also enlargement of the liver, as detected by the area of dulness, and usually slight tenderness in the right hypochondrium. As the disease advances, and the fibrous matter contracts around and obliterates the hepatic lobules, the spleen becomes hypertrophied, the liver diminished in size, the pain increased in intensity, the kidneys frequently become involved, and there are albuminuria, dropsical effusion and granular degeneration of the renal parenchyma.

A case occurred in the University Clinic of a German, who contracted the disease by the excessive use of tobacco and lager beer. His ordinary custom was, to drink from two to three quarts every twenty-four hours. He presented himself to the clinic in February, 1862, with the following symptoms: a short, jerking and persistent cough, œdema of the extremities, together with a general puffed condition of the entire surface. His urine contained a large per cent. of albumen, mixed with pus corpuscles. His digestion was feeble, he had chills, hectic fever, night sweats, and an irritable state of the bowels, alternated with constipation and diarrhœa. These symptoms increased, with the exception of the fever and chills, which were controlled by the use of baptisin and creasote, until the latter part of the month of April, when the patient died.

Upon making a post-mortem examination, the liver was found to be in a complete state of cirrhosis, the hepatic lobules almost entirely obliterated, and their places occupied by organized lymph. Granular degeneration had occurred in the kidneys, the left one presenting a complete state of congestion, while there was nothing remaining of the right, with the exception of its cortical portion, which contained large quantities of pus. There was extensive hypertrophy of the spleen, with indications of softening.

Treatment.—The treatment of cirrhosis, although not followed

by most favorable results, especially in the advanced stages of the disease, yet, in the commencement of the affection, there is every reason to believe that proper medication may be followed by success. All alcoholic stimulants should be avoided. The stomach should be evacuated as often as once or twice a week by a free lobelia emetic, the surface bathed daily with strong soda water, and the patient placed upon the following compound:—Take xanthoxylin, one dram; leontodin, one-half dram; leptandrin, two drams; muriate of ammonia, one and a half dram. Mix, and make thirty powders. Let one be administered half an hour after each meal. This prescription, in bad cases, should be continued for several weeks. The system should be well supported with vegetable tonics and iron; and, after the powders have been continued for a few weeks, they should be omitted, and five to ten drops of nitro-muriatic acid administered three or four times a day, in connection with the fluid extract of apocynin cannibinum, in sufficient quantities to maintain a gentle influence upon the bowels and kidneys.

A case that I treated successfully, I gave the above remedies, in combination with hot soda and sulphur vapor bath, twice a week. The following pill has also proved a remedy of great value in the treatment of cirrhosis:—Take gelsemin, ten grains; fel bovinum forty grains; extract of iris versicolor, forty grains. Mix, and make forty pills. Dose, one five or six times a day.

Pure air and out-door exercise, will also do much to facilitate the cure.

SYPHILITIC AFFECTIONS OF THE LIVER.

The tertiary form of syphilis is very liable to attack the liver. It produces a variety of forms of inflammation, essentially differing from those of pathological conditions, excited by all other causes, and is only amenable to specific or anti-venereal remedies. The pathological conditions, observed upon autopsic examination, are amyloid, lardaceous and waxy degenerations.

Symptoms.—The symptoms are those of serious hepatic derangement, but the constitutional existence of syphilis is the essential feature in the diagnosis.

Treatment.—The treatment for syphilitic disease of the liver consists in the use of small doses of iodide of iron and podophyllin, together with such other remedies as the nature of the case may indicate.

DISEASE OF THE HEPATIC BLOOD-VESSELS.

The hepatic artery and its branches may be the seat of disease, independently of those associated with organic affections of the liver; as the coats of the vessels may become affected, as seen in atheromatous aneurismal dilatation. It may be impossible to detect these conditions during life, although the presence of a pulsating tumor, acute pain in the right hypochondrium and jaundice may indicate the existence of aneurism of the hepatic artery. The portal vein may become obstructed by blood-coagula, resulting in inflammation of its coats, and a complete obstruction of the circulation

Symptoms.—The symptoms of this form of portal phlebitis are an increase in size of the abdominal veins, diarrhœa, enlargement of the spleen, inflammation, ulceration and suppuration of all the organs and tissues in which this vein originates, together with headache, pain in the right hypochondrium, chills, fever, jaundice, bilious vomiting, great prostration, and, unless the symptoms are alleviated, death usually takes place in a very short time.

Treatment.—The treatment for aneurism of the hepatic artery can only be palliative. Small doses of opium, rest, and a low vegetable diet promise the most favorable results. In case of stoppage of the circulation in the portal vein, either from congestion or inflammation of the liver, or from other causes, hot packs should be applied and frequently changed, and from one-fourth to one-half grain of the oleo-resin of lobelia administered sufficiently often to maintain as much nausea as the patient can tolerate, without producing vomiting. After this has been continued for ten or twelve hours, the quantity may be increased until vomiting ensues. After the vomiting, if the pain be relieved, and the other symptoms controlled, a few doses of quinine and the muriated tincture of iron will generally complete the cure.

If this portal phlebitis be of an adhesive character, and the venous canal be permanently obliterated, the symptoms can only be relieved by small doses of opium, hydrastin, etc.

HYPERTROPHY OF THE LIVER.

Hypertrophy of the liver is simply an over-growth, depending upon an increase of its structure, without any inflammatory de-

position, or the development of new and accidental tissues or products. It may affect the whole, or only a part of the organ. It is most common in children. Where it is simple hypertrophy, it does not amount to disease, but may produce ascites by obstructing the hepatic veins. There is no symptom by which it can be distinguished, save that of the increase of the area of dulness. There is usually but little disturbance of function, and but little *treatment* is indicated, excepting to abstain from stimulants and the use of animal food. Small doses of apocynin, administered two or three times a day, may in some cases prove beneficial.

ACUTE, OR YELLOW ATROPHY OF THE LIVER.

Acute or yellow atrophy, is a most dangerous disease, consisting in a rapid and complete destruction of the hepatic cells through every part of the gland, owing, perhaps, to impaired digestion. The functions of the liver are almost wholly suspended, and the evil effects of the accumulation of the elements of the bile in the blood exhibit themselves plainly in the deep jaundice, and the great disturbance of the nervous system. To this class belong most of those cases of malignant jaundice, which terminate rapidly in death after violent cerebral symptoms. The malady scarcely ever lasts a week; generally a few days only elapse before the patient becomes comatose, and dies.

Causes.—Women are more liable to this disease than men. Pregnancy seems to predispose to it, and it has happened more frequently between the third and seventh months of gestation. Among the exciting causes are grief or anxiety, sudden alarm, and fits of passion, venereal excesses, syphilis, the excessive use of mercury, drunkenness, the influence of malaria, and the poison of typhus.

Symptoms.—The complaint sometimes commences with nausea, a furred tongue, irregular action of the bowels, and a frequent pulse. At other times it is ushered in abruptly, with pain in the head and vomiting, at first of the contents of the stomach and mucus, but afterwards of a matter like coffee-grounds, which consists of dark, disintegrated blood, with abnormal conditions of the nervous system, delirium, and convulsions, followed by stupor and coma. The skin is of a deep yellow hue, and becomes hourly more intensely discolored. Jaundice is always present. The pulse is generally

very rapid, but sinks at times, without any assignable reason, to a normal frequency. When profound coma occurs, it becomes slow and full. There is fever, and the surface may be covered with petechiæ, owing to the increasing dissolution of the blood. The tongue and teeth are covered with sordes, the abdomen is tender, the extent of hepatic dulness rapidly diminishes, while that of the spleen increases; there are constipation, with hard clay-colored stools, and subsequently evacuations, which are black from the presence of blood; while the urine is loaded with bile pigment, and generally is albuminous. As the jaundice increases, there are hemorrhages from the nose, stomach, bowels, bronchi, etc.

Diagnosis.—Acute atrophy differs from acute inflammation of the liver, by the marked jaundice, the cerebral symptoms, the rapid diminution in the volume of the liver, the frequent pulse, and the occurrence of hemorrhages. It is distinguished from *enteric affections*, by the character of the eruption, the presence of diarrhœa, the milder nature of the mental wandering, and the slower progress in the latter disorders.

Morbid Anatomy.—The liver is found after death considerably diminished, sometimes being reduced to the extent of one-half, or even two-thirds of its natural size. The capsule is opaque and shrivelled; while the parenchyma is flabby and shrunken, the cut surface presents a dark-yellow hue, the outline of the lobules is invisible, and the blood-vessels are almost empty, while under the microscope no hepatic cells can be detected, but only brown granules of biliary matter, with oil globules, or isolated cells loaded with fat or pigment are discovered. The gall-bladder is usually empty, and the bile-ducts are free from any obstruction. Sometimes the spleen is found congested and enlarged, and the glandular epithelium of the kidney in a state of fatty degeneration.

The chronic form is not essentially different from that of the acute. It only differs in the degree of severity, and rapidity of the changes which give rise to the symptoms.

Treatment.—In acute atrophy of the liver, no remedy exerts a more marked and salutary impression than that of lobelia. It should be administered in connection with stimulating drinks, such as ginger and capsicum, until free vomiting occurs. At the same time, an alcoholic vapor bath should be administered, and stimulating

liniments applied over the region of the liver, and along the spine.

The cause should be removed, and immediately after the emetic and vapor bath the bowels should be evacuated with small doses of podophyllin and neutralizing cordial. This should be followed by quinine and the muriated tincture of iron. The following is a good prescription:—Take quinæ sulphas, twenty grains; aqua pura, four ounces; tincturii ferri hydrochloridii, one ounce. Mix. Dose, a teaspoonful every hour.

The liver may be stimulated with small doses of leptandrin, leontodin, and xanthoxylin. The vapor baths and the lobelia emetic should be repeated every two or three days; and if there be jaundice, with great prostration, a decoction of euonymus atropurpureus and galium aparine should be drunk freely.

When there are nausea and vomiting, small doses of nitric acid and acetate of morphia may be administered. Sulphate of soda, in combination with the fluid extract of taraxacum, and the application of an irritating plaster over the liver, are also remedies that have been recommended.

FATTY LIVER, OR SOFTENING.

The hepatic cells, in their normal state, contain a certain amount of oil. But in *fatty* degeneration, the quantity is considerably increased. On microscopical examinations, the cells may be seen gorged with oil-globules. There are two forms of fatty liver, one, in which the oil accumulates in the organ from over-production; the other, in which it takes the place of the healthy tissue, and which is the true fatty degeneration. The liver is usually enlarged. The weight is not increased in proportion to the enlargement. Its characteristic hue is a pale-yellow, or cream color, interspersed with brownish, deep orange, or reddish spots or points. The organ is generally softer than in health. When cut, it has a brownish or pale-yellow color, which is usually modified by innumerable red points. It has an unctuous feeling between the fingers, and when moderately heated, furnishes much oily matter. We have no means of forming an accurate *diagnosis* of this complaint. It may be suspected when the liver is considerably enlarged in phthisis, or in Bright's disease, without the attendant pain and tenderness of inflammation.

Causes.—It generally occurs in drunkards; in persons who lead indolent lives, and are large eaters; in wasting diseases; in the course of a protracted diarrhœa; and sometimes in children after exanthematous fevers; but of all these causes, pulmonary consumption is the most common.

Symptoms.—The symptoms are very much the same as those of hepatic congestion, excepting that there is perhaps a tendency to diarrhœa, and that in some instances we find a pale, smooth, greasy-feeling skin.

Treatment.—When fatty degeneration of the hepatic tissue occurs as the result of tuberculous, scrofulous, and syphilitic disease, previously to treating the hepatic difficulty, the affection producing it should be removed, if possible; afterwards an effort should be made to restore the tissue of the liver to its normal condition, by the use of leontodin, leptandrin, podophyllin, and muriate of ammonia. Where the disease is produced by an excessive use of alcohol, high living, and want of exercise, the cause should be removed, and from one-eighth to one-fourth of a grain of podophyllin, and one grain of ammonia administered two or three times a day. In protracted cases, an irritating plaster should be applied over the liver, and renewed until a free discharge is produced. If the disease should not yield to the above treatment, an alcoholic vapor bath should be administered every night for a week or ten days, and a lobelia emetic given once or twice a week. A compound podophyllin granule, taken at bed-time, has also a good effect in this disease. Where the disease is associated with full habits, and has been produced by over-stimulating food, wines, beer, etc., they should be prohibited, and the diet consist mostly of vegetable matter, connected with baths, fresh air, and out-door exercise. But when the disease is the result of scrofula, tuberculous and other affections, indicating feeble vitality and great exhaustion, the diet should be highly nutritious, and a liberal amount of stimulus may be administered with much benefit.

NUTMEG LIVER.

In nutmeg liver, the gland exhibits in its cut surface a veined appearance, produced by two distinct colors, conspicuously intermingled, as seen in the section of a nutmeg. These colors are

usually red, and yellowish or whitish, and are owing, the former to sanguineous congestion, and the latter, probably, to the impermeability of portions of the tissue, from destruction or occlusion of the blood-vessels. The condition does not depend on any one lesion, but may result from whatever produces degeneration of the tissue in closely neighboring minute sections, irregularly intermingled with unaltered parts. It is the result of chronic inflammation, and constitutes one of the forms of degeneration, the result of this affection. The treatment is essentially the same as that described under chronic hepatitis.

WAXY OR ALBUMINOUS DEGENERATION.

This is another form of degeneration of the hepatic structures, produced mostly by some specific irritation upon the glands, as syphilis, mercury, and the excessive use of malt liquors. In this disease the glandular structure becomes denser, the organ much increased in size and weight, presenting the appearance of yellow wax, from which it has derived its name, waxy liver. Upon making a microscopic examination, it is discovered that the hepatic structure has been subject to chronic inflammation, and that the liquor sanguinis, which has escaped from the hepatic capillaries, has undergone granular degeneration, obliterating the hepatic cells, and essentially interfering with the functions of the liver. It being the result of chronic inflammation, the treatment has already been described under that head.

PIGMENT LIVER.

We frequently find peculiar changes of the liver associated with functional derangements of the organ, and of the parts pertaining to the portal system after death, from severe intermittent, remittent, or continued fevers. The liver presents a steel-gray, blackish, or a chocolate color, brown insulated figures being observed upon a dark ground. This change is owing to the degeneration of the liquor sanguinis into pigment granules. The liver is not the only organ implicated in the morbid process; the spleen is commonly affected. The blood becomes watery, its corpuscles are broken down, and it contains large quantities of pigment, which condition is also observed in the kidneys and brain. It is not unusual to find grave

cerebral disturbance, albuminuria, intestinal hemorrhage, and profuse diarrhœa. The skin presents a singular ash, or grayish-yellow color. The fever is of an intermittent type, the pulse is not much accelerated, and the jaundice is generally slight.

Treatment.—This form of disease of the liver, mostly occurring as the result of pernicious intermittent or remittent diseases, should be treated with quinine, iron, stimulants, leontodin, podophyllin, and leptandrin.

HYDATIDS OF THE LIVER.

Hydatids are small encysted parasites, that are occasionally developed in the liver, and other organs of the body. They consist of the primitive development of the tapeworm, and in this stage of their formation are denominated *echinococci*, and are the larvæ of the tænia echinococcus of the dog and wolf. It consists of a thin, transparent, orange-shaped cyst, of a greater or less dimension, in which numerous small ones are developed.

In a case of hydatids of the liver, which occurred in my practice, nearly one-half of the lobulus spigelia was converted into a semi-transparent cyst, which, upon being cut, was followed by the escape of a large number of smaller ones, varying in size, and very much resembling turtle's eggs.

These cysts contain immense numbers of primitive tapeworms, and are described as follows by Dr. Cobbold:—"This immature tapeworm, the scolex of the tænia echinococcus, is a transparent, colorless, oval-shaped worm, displaying an apparatus of suctorial prominences, with a variable number of hooklets at the cephalic extremity, and measuring about the one-two-hundredth of an inch in length, and rather less in breadth. In structure the parasite is a mere integument, one-half the head and neck being susceptible of retraction into the other half. The head is a flat disc at the extremity of the neck, having imbedded in its substance an apparatus of small hooks, thirty-four in number, disposed in a circle. Immediately behind the head are four rounded suctorial processes, beyond which follows the body, while at the extremity of this is a short peduncle, by which the animal attaches itself to the walls of the acephalocyst. When the animal is viewed with its head retracted within its body, the circle of hooks is seen through the transparent integument, appearing like a ring in the centre of the body.

They are developed in the human species by the introduction of this larvæ into the stomach, mostly through the medium of water. If they lodge upon the liver, hydatid tumors may be the result, although they are frequently found in other parts of the body.

A case was related to me by a medical friend, of a large number of these hydatids being expelled from the uterus of a lady, who had been laboring under uterine difficulties for some years.

Symptoms.—When hydatids occur in the liver, their growth is generally very slow. They give rise to little inconvenience, excepting a sensation of weight in the right hypochondrium.

When they are of large size, they may be felt very easily by an external examination. Sometimes they compress the portal vein, or vena cava, causing ascites and œdema of the legs. On percussion, fluctuation may be detected where the tumor is large, and the tumoral resonance will be elicited. Owing to the pressure of the tumor upon the heart and diaphragm, cough, palpitation, and sometimes jaundice and ascites occur.

Diagnosis.—It is not generally difficult to detect the presence of hydatids, except when they are small and deep-seated. A large and superficial hydatid tumor can easily be distinguished.

Treatment.—Formerly the remedy principally relied on in the treatment of this, as well as other forms of hepatic difficulties, was calomel; but most extensive observations with this drug have demonstrated that it possesses little power over the difficulties. The remedy that is now principally relied on for the absorption of the hydatid cyst, is iodide of potassium. This drug is usually administered in full doses, and the impression continued until constitutional symptoms are developed. Numerous cases are on record where this plan of treatment has proved successful. From five to twenty grains are usually administered every twenty-four hours.

In a case that came under my charge, I used, in connection with the iodide of potassium, from ten to twenty drops of the oil of solidago three times a day. I cured one case of unquestionable hydatids of the liver, by administering one teaspoonful of Mecca oil four times a day. Common salt has enjoyed an extensive reputation in the cure of hydatids; and since its relation to tænia has been established, the oil of male fern has been highly recommended.

HEPATIC TUMORS.

Encysted scirrhous, and sometimes fibrous tumors, are formed in the liver. They may be composed of granular matter and fat corpuscles, or of fibrous tissue; or they may be of a cystic character, confined mostly to the surface, containing dark venous blood. They vary in size, in some instances weighing a pound or more. They are the product of inflammation of the various tissues of the liver, and of the morphological changes occurring in the exudation.

Treatment.—The treatment is the same as that of chronic inflammation and hydatids.

CANCER OF THE LIVER.

Cancerous infiltration into the hepatic structure is no uncommon difficulty. It embraces all the varieties of the disease, but the medullary form appears to be the most common. In the early stage the cancer cells usually accumulate in small patches, and may be found in various portions of the liver. They may increase in size until the entire structure is involved in the cancerous difficulty.

Symptoms.—The liver becomes much enlarged; there are marked indications of malignant hepatic disturbance, as jaundice, ascites, great pain, irritation of the skin, high-colored urine, which sometimes, upon microscopical examination, is found to contain cancerous cells. There are loss of appetite, obstinate constipation of the bowels, nausea, vomiting, and in many cases a most persistent and harassing cough. There are great depression of spirits and rapid exhaustion. The patient becomes emaciated, and in the majority of cases dies in the course of a few months, although in some instances it is much more protracted.

Causes.—Cancer of the liver usually results from the transfer of the disease from some other part of the body, although it may occur without existing in any other portion.

Treatment.—The treatment for cancer of the liver can probably be little more than palliative. The pain should be allayed by opiates, the bowels kept open by small doses of castor oil, and the strength supported by general tonics. We are not acquainted with any remedy that promises a cure in this affection. Arsenic is supposed to exert a favorable influence over cancerous diseases; and

when there is unmistakable evidence of this affection, it may be administered with a view of arresting its progress, or alleviating its malignancy. From five to ten drops of Fowler's solution, three or four times a day, is the best form in which to administer it.

A medical gentleman of this city, recently related a case of cancerous liver, as cured by the use of Donovan's solution. Since his report, however, his patient suddenly died; whether from the effect of the cancer or the medicine, we are not able to say.

TUBERCLES IN THE LIVER.

Tuberculous deposits are very seldom found in the liver; and when they do occur, they are generally the result of constitutional phthisis. The form of tuberculous infiltration is that of the miliary character.

Symptoms.—The symptoms are those of general tuberculous consumption, complicated with hepatic disturbance.

Treatment.—The treatment of tubercles of the liver, is essentially the same as that described under the head of tuberculosis.

INFLAMMATION OF THE GALL-BLADDER AND BILIARY DUCT.

Inflammation of the gall-bladder and biliary duct may occur, and present all the phenomena peculiar to inflammation of the mucous membranes of other parts of the body. The most ordinary form of this disease is catarrh, which has its origin in chronic inflammation of the stomach and duodenum. When inflammation of the gall-bladder and biliary duct occurs, there is frequently thickening of the walls, and obstruction in the discharge of bile. It may also terminate in ulceration, in which event there is more or less dilatation, and sometimes it may result in perforation.

Ulceration of the gall-bladder and biliary duct may also occur as the result of biliary calculi.

Symptoms.—The symptoms to which this affection gives rise depend much upon the stage and extent of the inflammation. Where it is a simple catarrhal inflammation of the biliary duct, there is a tenderness above the epigastric and right hypochondriac regions. There are inactivity of the bowels, nausea, rigors or chills, and febrile reaction. The tongue is usually loaded and brown, the urine

high-colored and scanty; and if the disease continue for a few days, jaundice makes its appearance. If, from organization of the exudation, or other causes, the biliary passages should become obstructed, inflammation and ulceration of the gall-bladder will usually follow; and if the obstruction be not removed, perforation of the gall-bladder may occur, and fatal peritonitis be the result, or adhesion may take place between the gall-bladder and the bowels, a fistulous opening formed, and the bile discharged directly into the intestines; or the gall-duct may become permanently obstructed, the bile inspissated in the gall-bladder, the hepatic lobules atrophied, together with an obliteration of the hepatic cells, thus preventing the formation of bile by the liver, and producing a perpetual jaundice.

Remarkable cases of this kind are on record, where the patient has enjoyed a moderate degree of health.

Treatment.—When the disease is an extension of inflammation of the stomach and duodenum, it will usually yield to the treatment prescribed for those diseases. When it originates from the presence of gall-stones, or other causes, the treatment should be premised by a lobelia emetic, hot soda bath, and a purge, composed of equal parts of neutralizing mixture and fluid extract of leptandria Virginica. With each dose of the purge, a few drops of the tincture of gelsemin should be administered, for the purpose of more directly controlling the inflammation, and overcoming the spasms of the biliary duct. Hot packs should be applied over the region of the liver, and frequently changed. When this treatment does not control the inflammation, an alcoholic vapor bath should be administered every day, and the following compound given:—Take podophyllin, two grains; leptandrin, thirty grains; gelsemin, two grains; oleo-resin of lobelia, five grains. Mix, and make thirty pills. Dose, one four or five times a day.

ENTOZOA IN THE BILIARY PASSAGES.

The ascaris lumbricoides sometimes enters the ductus communis choledochus, and passes into the gall-bladder, even up the branches of the hepatic duct. Cases are recorded in which the duct has been obstructed, obstinate jaundice produced, and even adhesive inflammation, permanent closure of the duct, and death, as the result of the presence of the lumbricoides.

The distoma lanceolatum has also been found in the hepatic duct and liver.

Treatment.—There is no treatment that is known to have a specific influence over these hepatic parasites. It is probable that spirits of turpentine, the oil of worm-seed, and other essential oils, possessing anthelmintic properties, may be serviceable.

GALL STONES.

These concretions are found in the gall-bladder and hepatic ducts. They are oval or pear-shaped, although, when several are found together, their sides may be compressed. Their surface is sometimes flattened by pressure. They vary in size, from that of a small pea to a fowl's egg. They are, usually, of a reddish-brown tint, and consist of two varieties, the *homogeneous* calculi, consisting of a saponceous and crystallized substance, and the *compound* calculi, containing a central nucleus, surrounded by a mass of greater or less thickness. The chemical constituents are cholesterine, from eighty to ninety per cent., chlolochrome or coloring matter, combined with phosphate and carbonate of lime, magnesia, biliary and fatty acids. They seldom appear before advanced life. When they are met in the branches of the hepatic duct, they are very small, and appear in the form of round seed-like calculi. It is very rarely that they obstruct the hepatic duct; but when they do, they produce much pain, jaundice, and other difficulties of the liver.

Causes.—Females are more subject to them than males. Excessive eating and drinking predispose to them. They are also produced by parasites in the gall-bladder, which may partly decompose and form a nucleus for their development. They may also occur as the result of chronic inflammation of the mucous membrane of the hepatic duct.

Symptoms.—When they occur in the hepatic duct, they may give rise to a dull, heavy pain in the liver, and that of a nervous, sympathetic character in the shoulder, followed by more or less febrile excitement. When they exist in the gall-bladder, they may give rise to intermittent fever, nausea, vomiting, jaundice, and constipation; and if they leave the gall-bladder, they produce excruciating pain, mostly of a colicky character. The patient tosses and throws himself about in bed; there is great tenderness of the right

hypochondrium and epigastrium, persistent nausea and vomiting, and obstinate constipation. There are frequently chills or rigors. The greater the stone, the more excruciating the suffering. If the stone recedes into the gall-bladder, there will be a temporary absence of pain; but if it attempts to pass through the duct, the pain and other symptoms will be renewed. If the stone should be obstructed, or become impact in the cystic duct, and a perfect obstruction occur, inflammation, ulceration, or perforation of the duct or bladder, together with all the accompanying difficulties, may occur.

Treatment.—The first object in the treatment, should be to overcome the spasm of the bladder, and relieve the pain. This can be accomplished by giving a vapor bath, in connection with a lobelia emetic. Hot packs should be applied over the right hypochondrium. The bowels should be opened by a brisk purge of neutralizing mixture and fluid extract of leptandria. Belladonna plasters, applied over the region of the liver, have been highly recommended for the purpose of dilating the cystic duct and alleviating pain. When the vomiting is severe, small lumps of ice, swallowed, will usually relieve it. Inhalation of ether, chloroform, and nitrous oxide gas, have also been recommended for the same purpose. Nitric acid, administered in connection with a strong decoction of eupatorium purpureum, in the proportion of two ounces of the decoction to ten drops of the acid, given every two or three hours, has proved the most serviceable remedy in this form of calculi. The emetic may be repeated, in case the gall-stone does not escape from the biliary duct, followed by an active purge of podophyllin and anti-bilious physic. It would be well to examine the alvine evacuations, to ascertain whether the calculi have escaped.

JAUNDICE OR ICTERUS.

Jaundice is characterized by yellowness of the skin, eyes and urine, owing to the deposit of the coloring matter of the bile in the blood. The presence of this bile-pigment in the blood, or cholæmia, may be due to the reabsorption of bile after having been secreted by the liver; an opinion founded upon one of the causes of jaundice, the obstruction of the ductus communis, or one or more of the branches of the hepatic duct, by a gall-stone, or by the presence of a tumor, etc. But among the most common causes of jaundice, is

a deficiency of the secreting cells of the liver, owing to which there is no biliary secretion.

Jaundice is considered by some authors, an idiopathic affection; but it is chiefly an effect or symptom of some special disease, and for which it serves as a diagnostic indication. It is a phenomenon of bilious remittent and of yellow fever, and of different affections of the liver, gall-ducts and stomach. When it comes on with indigestion, slight fever, sluggishness, and pain in the right hypochondrium, it may be regarded as a functional disease of the stomach and liver; but when it follows violent and spasmodic pain in the region of the liver, it is dependent upon the arrest of calculi in the biliary passages. When it precedes delirium or coma, and convulsions, it indicates disorganization of the hepatic cells; and when it comes on slowly, and continues a long time, and acquires a dark tinge, it depends either upon organic disease of the liver, or some of the neighboring organs obstructing the discharge of bile into the duodenum.

Symptoms.—The presence of the bile-pigment in the blood produces weariness, anorexia, thirst, indigestion, constipation, restlessness, nausea, and sometimes vomiting, a slow pulse, rigors, alternating with flushes of heat, a feeling of fulness in the epigastrium, and a sedimentous condition of the urine. In a few days, a sensation of itching is experienced over the surface of the body, the tongue is furred, the mouth bitter, the stools are clay-colored, and, finally, the yellowness of the surface is presented. The itching which accompanies this symptom, is at times almost intolerable, requiring the use of opiates to alleviate it. The shades of yellowness vary in different individuals. It may be of a light yellow, a lemon-yellow, or a deep orange or golden hue. Sometimes, this appearance is modified by a greenish tinge, and, in some rare cases, the color almost approaches to a black-caste, dependent upon a depraved condition of the blood. The urine, perspiration, and all the other secretions are, more or less, tinged with bile; the milk and the mucous secretions, however, are seldom affected. Although the conjunctiva is deeply tinged, yet the vision remains unimpaired, excepting when the bile-pigment is deposited in the humors of the eye, in which case, all objects present a yellow appearance.

After the appearance of this yellowness, the premonitory symp-

toms are modified, although they still continue in a greater or less degree.

Jaundice may continue for a length of time without producing much constitutional disturbance. Frequently, patients experience very little inconvenience. The symptoms and prognosis depend mostly on the pathological conditions with which the disease is associated. If it result from the presence of a calculus in the common or hepatic duct, the recovery will depend on its exit into the intestine or gall-bladder. When there is permanent obstruction from these calculi, or a deposit of lymph in the ducts, or the presence of a tumor, the jaundice may be very persistent, and not be attended with any serious results for months, and even years. The duration of the disease is usually from one to two or three weeks. Sooner or later, however, the body emaciates, the patient becomes anæmic and cachectic, stupor, delirium, or some other cerebral disorder sets in, night-sweats ensue, hemorrhages or dropsical effusions occur, the respiration is oppressed, the vital powers gradually fail, and the disease terminates fatally.

Diagnosis.—The diagnosis of jaundice can be readily ascertained. The yellowness of the surface, observable in some cases of intermittent fever, anæmia and cancer, are readily distinguished from jaundice by the absence of coloring matter of the bile in the conjunctiva in these diseases.

Anatomical Characters.—In post-mortem examinations, there is found a yellowness of nearly all the tissues of the body, even the bones. The adipose tissue is particularly discolored. The substance of the brain usually remains in its natural state.

Treatment.—The treatment of jaundice must depend essentially upon the cause producing it. When it is produced by a suppression of the excretion of the bile, a lobelia emetic, followed by a hot vapor bath, and a purge of anti-bilious physic, podophyllin and quinine, will do much to overcome the difficulty. An irritating plaster should be applied over the region of the liver, and small doses of equal parts of leontodin, leptandrin, podophyllin and sulphur administered three or four times a day. The emetic, purge, and vapor bath should be repeated once or twice a week. The itching may be relieved by sponging the body in hot soda water three or four times a day. Five or ten drops of sulphuric acid, in

connection with a teaspoonful of the fluid extract of hops, administered at bed-time, will also prove valuable. When the disease arises from inflammation of the gall-bladder or biliary passages, the treatment already prescribed for those difficulties should be adopted. Ten grains of chloride of soda, five grains of the flour of sulphur, and one grain of bi-carbonate of potash, administered two or three times a day, in a teaspoonful of Orleans molasses, has also proved a valuable remedy in some cases. Equal parts of the fluid extract of liriodendron tulipifera, and populus tremuloides, administered two or three times a day, has also proved very successful in some instances. The chlorate and sulphate of potash have been highly recommended, alternated with sulphate of soda. The diet should consist mostly of fresh vegetables, and as much out-door exercise should be taken as the patient can bear.

DISEASES OF THE PANCREAS.

The pancreas is rarely the seat of disease. The symptoms of its morbid conditions are usually obscure; consequently, an accurate diagnosis is made with difficulty. It may be affected by inflammation of a passive or active character. In enteric, typhus and puerperal fevers, it occasionally becomes involved in inflammation. The morbid appearances presented are engorgement, softening, hypertrophy, suppuration, induration, atrophy, fatty degeneration, hydatid cysts, cystic tumors, and scirrhous or medullary cancer. Calculous concretions of a white color, varying in size, may be found in the pancreatic duct, or its branches. Gangrene has sometimes been observed.

Symptoms.—The symptoms of diseases of the pancreas are pain in the epigastrium, enlargement and tenderness of the gland, a sensation of heat and constriction, salivation, nausea, and vomiting, diarrhœa, anorexia, despondency, chills alternated with flushes of heat, and debility, with great emaciation. The vomiting, in some instances, is very obstinate, the matters ejected are thin, ropy, and of a sour or saltish taste. Jaundice is often a prominent symptom. Fat in the stools has been frequently observed. An abscess of the gland may open into the stomach.

When the pancreas is the seat of cancer, the symptoms are analogous to those of scirrhus of the liver, and the two diseases are apt to be associated.

When calculous concretions are found, they cause intense pain in their passage to the duodenum. In congestion, and mild forms of inflammation of the pancreas, there are symptoms of dyspepsia, connected with frequent eructations of a sweetish, sickish fluid, and it is not unfrequently that pyrosis depends upon chronic inflammation of this gland. This being one of the organs of digestion, whenever it becomes diseased, it produces more or less derangement of this function. In all cases where the disease extends to the choledic duct, and interferes with the passage of the pancreatic secretion into the duodenum, the oleaginous elements of food fail to be converted into an emulsion, consequently nutrition is imperfect, as it is now a well-established fact that the molecules of oil which are formed by the influence of the pancreatic juice upon the hydrocarbons of the food are essential to the development of red blood-corpuscles; hence, leucocythemia, anæmia, marasmus, and even tuberculosis, may occur as the result of some of the morbid conditions of the pancreas.

Treatment.—There is as yet no known specific treatment for inflammation of the pancreas; hence, when it is known to exist, it must be controlled by equalizing the circulation, hot packs, veratrum, aconite, mild purges, etc. Certain remedies are known to increase the function of this gland, such as podophyllin, irisin, and phytolaccin; and it is more than probable that in the chronic form, these agents may be administered with benefit. In several cases, where there has evidently been chronic congestion and inflammation of the pancreas, I have given from one-half to one grain of the oleo-resin of lobelia, and one grain of capsicum, made in the form of a pill, every two or three hours, with decided benefit.

DISEASES OF THE SPLEEN.

There is, perhaps, no organ in the body, about which there has been more controversy, as to its function, than the spleen. By many physiologists, the spleen has been considered a mere reservoir to regulate the circulation between the outer and inner tissues; while others have characterized it as of little importance, and not essential to health. Cases are on record, in which the spleen has been removed, without affecting the health for years. In some countries, the practice of removing the spleen in pigs, for the pur-

pose of facilitating the fattening process, has been resorted to, and it has been suggested that in diseases of debility the same practice might prove successful. This does not, however, correspond with the observations of Mr. Bennett, who has found the most malignant and fatal forms of blood diseases to be uniformly associated with affections of the spleen. So uniformly has this proved to be the case, that he believes the spleen to be essentially concerned in the manufacturing of blood, and that when this organ becomes so diseased as to interfere with its function, blood difficulties are the result. The most casual observer, who is familiar with the influence of vegetable malaria over this gland, and the frequency with which permanent hypertrophy and alteration of tissue occur in connection with malarial fevers, must admit the influence of the spleen over the condition of the blood. In all chronic agues, where the spleen has become permanently disordered, there are a sallow complexion, a thin and watery state of the blood, a tendency to dropsy, and other conditions dependent upon a diseased state of this fluid. Whatever may be the function of the organ from its central position, its peculiar vascular structure, the elasticity of its tissues, together with the distressing symptoms that ensue upon the organ becoming diseased, we are well assured that it exerts a most essential influence upon the animal economy. There is, probably, no organ in the body more liable to congestion than that of the spleen, as whenever, from diminished temperature, or other causes, the blood recedes from the surface, the spleen becomes temporarily enlarged. It is from this fact that some have supposed it to be a reservoir for the accumulation of blood; but it is found that this temporary hyperæmia subsides whenever the blood returns to its surface, or its equilibrium is established. The same thing occurs during the cold stage of all diseases, especially in remittent and intermittent fevers; as upon the approach of the cold stage, the spleen gradually increases in size, until, in some instances, its capacity is four or five times that of its normal condition.

Many cases are on record, where, during the congestive or cold stage of fevers, this accumulation of blood has been so extensive as to produce rupture of the spleen, and death. A case of this kind occurred in my own practice, where, during the ague chill, the spleen became enormously distended, the patient seized with violent pain

in the left hypochondrium, which was soon followed by syncope and death. The autopsy revealed a spleen weighing eight to ten pounds, ruptured nearly its whole extent, and the escape of a large quantity of blood. There was no alteration in the structure, and the congestion was of an acute character. The spleen is liable to become inflamed, congested, indurated, softened, dropsical, or it may be the seat of hydatids, cancers, tubercles, and other transformations of the exudation.

Symptoms.—Enlargement of the spleen, or ague-cake, as it is sometimes called, is generally associated with a sallow and unhealthy state of the skin, and an anæmic condition of the mucous membrane. The patients are liable to hemorrhage, and there are dyspeptic symptoms connected with irregularities of the bowels, the discharges usually being dark and offensive. If the disease be of long duration, the blood becomes altered in character, and there is dropsical effusion. Where there is extensive enlargement of the organ, it may crowd upon the heart, prevent the descent of the diaphragm, and thus interfere with the cardiac function and respiration. There is usually but little pain, unless the peritoneum becomes involved, in which event there will be acute pain and tenderness upon pressure. *Hypertrophy* of the spleen can be detected by the increase in the area of dulness on percussion, and the extension of the organ below the ribs. In females, the disease has a remarkable influence over the menstrual function, there usually being dysmenorrhœa, associated with great nervous irritability. In males, it is liable to produce spermatorrhœa and impotency.

Causes.—Vegetable malaria is probably one of the most active agents in producing diseases of the spleen, although Dr. Abercrombie regards mercury as one of the principal causes of splenic diseases; and it is more than probable that the sallow complexion, and anæmic condition of the system generally, are partly due to the influence of this drug upon the spleen. Tuberculous deposits may occur as the result of a general tuberculous cachexia. The pathological conditions of the spleen, such as induration, softening, etc., are but the changes occurring in the exudation succeeding the inflammation.

Treatment.—The treatment of hypertrophy of the spleen, produced by vegetable malaria, consists in the use of antiperiodics and

iron, such as quinia, ferro-ferricyanidum, in combination with irisin and leptandrin. Dr. Robert Williams, of St. Thomas' Hospital, London, speaks very highly of bromide of potassium as a remedy of great value in chronic enlargement of the spleen. Dr. Tanner states that mercury, in all forms, as well as blood-letting, is most injurious. When there is dropsical effusion in the organ, as frequently occurs after chronic ague, one or two grains of apocynin, with equal quantities of hypophosphite of iron, is a most effective remedy. In acute splenitis, emetics, hot packs, and purges, may be required.

INFLAMMATION OF THE BOWELS.

The intestinal tube is very seldom affected throughout its whole extent. It will, therefore, be more convenient to divide it into different sections, and describe each disorder separately.

DUODENITIS.

The duodenum is very rarely independently affected; but when it is the seat of inflammation, it is usually connected with some gastric derangement, or enteritis The symptoms diagnostic of this disease are obscure pain, weariness or distress after eating, and tenderness below the epigastrium. The most striking phenomenon is the peculiar jaundiced appearance of the skin. This condition has been ascribed to obstruction, either from swelling of the mucous membrane of the duodenum at the opening of the ductus choledochus, or from an extension of the inflammation into the duct.

The pain experienced is usually felt about two or three hours after eating, arising from the passage of the ingesta into the duodenum. The bowels are usually constipated.

The *causes* of duodenitis are the same materially as those of gastritis. Mr. Wilkes has observed a peculiar relation between the integument and the duodenum, and states that in several instances, after severe burns, patients were seized with duodenitis, ulceration, perforation, resulting in death. If these observations be well founded, blisters, sinapisms, and chafing liniments, may produce irritation and inflammation of the duodenum.

The anatomical characters are also similar to those of gastritis, and require no particular notice, excepting the glands of Brunner,

which are very much enlarged, sometimes exhibiting elevated, irregular patches of considerable size and extent.

Treatment.—Duodenitis is usually associated with malarial fevers, and requires but little additional treatment to that of the disease from which it results. In some instances, however, the inflammation assumes a chronic character, and requires especial attention. In all cases, hot packs should be applied over the duodenum, and constantly changed, and the skin should be kept moist by the use of small doses of the tincture of corollorhiza odontorrhiza. From ten to fifteen drops of the tincture of bryonia should be added to a tumbler of water, and one teaspoonful administered every half hour, or hour. If there be symptoms of softening of the mucous membrane of the duodenum, or ulceration of the glands of Brunner, small doses of rhusin and chlorate of potash may be beneficially administered at short intervals. In the acute form, an active lobelia emetic will have a most beneficial influence; and where it is associated with malarial influences, quinia, or the sulphate of cinchonia, should be given. The bowels should be opened by warm water enema, the patient ordered to drink freely of mucilaginous liquids, and the diet consist mostly of nutritive broths.

TYPHILITIS, OR INFLAMMATION OF THE CÆCUM.

The cæcum and its appendages may be seriously diseased, without any other portion of the intestines being involved.

Symptoms.—In typhilitis, there are always more or less constitutional disturbance, slight fever, nausea, constipation, together with fulness and tenderness in the right iliac region, the pain being much aggravated by pressure. The patient lies on the right side, with the trunk bent, and the knees drawn up, so as to relax the tissues about the seat of inflammation. If the disease progress, the peritoneal surface of the cæcum becomes involved, the appendix is inflamed, the areolar tissues are affected, and suppuration and abscesses result. The abscesses may open externally, or into the intestinal canal, and the patient recover; but sometimes the matter is discharged into the cavity of the peritoneum, causing great suffering, and in a few hours, death.

If the inflammation commence in the appendix, from constitutional causes, or owing to the presence of morbid matters, the symp-

toms are usually very acute, consisting particularly of excruciating tormina, violent sickness, pain in right testicle and thigh, and obstruction of the bowels. Gangrene and general peritonitis frequently ensue, and prove fatal.

Occasionally we meet with *chronic* cases of this disorder, in which the symptoms advance very slowly, with failing health, weakness, and loss of flesh, colicky pains in the right iliac region, flatulency, anorexia, and diarrhœa, alternated with constipation. Occasionally there is congestion of the mucous coat of the bowels, producing numerous mucous discharges and hemorrhages. If death occur, it is usually from exhaustion; while in autopsy the intestinal coats are found considerably thickened, inflamed, and ulcerated. Perforation rarely occurs.

Causes.—Inflammation of the cæcum is most frequently caused by the accumulation of feculent matter, undigested food, or insoluble bodies taken into the stomach, as the stones of fruit, etc.

Treatment.—This disease, mostly originating from the presence of foreign bodies, or the accumulation of scybala in the parts, the first indication is to remove the cause. The bowels should be injected by large quantities of warm water, and two or three ounces of castor oil should be administered and repeated until a free action of the bowels occurs. At the same time, a large hot pack should be applied over the loins, and frequently changed. If the warm water injection and the castor oil fail to remove the irritating accumulation, two or three ounces of the tincture of lobelia should be added to equal parts of milk and water, and be injected into the rectum. This may be repeated every half hour until the offending agent is removed. The inflammatory condition may then be controlled by aconite, veratrum, and hot packs. If there be chronic inflammation and ulceration of the mucous membrane of the part, a wine-glassful of the warm decoction of comptonia asplenifolia, administered three or four times a day, in connection with such general constitutional treatment as is required, will usually remove the difficulty.

ENTERITIS.

Enteritis, or inflammation of the small intestines, may be confined to the mucous membrane, or involve all the tissues of the in-

testinal tube. Enteritis proper, however, is usually confined to the mucous membrane, and differs essentially from peritonitis, or inflammation of the outer covering. Like gastritis, inflammation of the mucous membrane of the small intestines is a rare disease, unless produced by mechanical violence, or the result of some other affection.

Symptoms.—Enteritis is usually ushered in by rigors, chills, and violent febrile reaction, which are associated with nausea, vomiting, tenderness of the abdomen, and in obstinate cases, diarrhœa. The patient usually complains of great prostration. There is a feeble, quick, and sometimes intermittent pulse. The respiration is hurried, the features pinched, and, notwithstanding the hot and pungent condition of the surface, the hands and feet are usually cold. There are dorsal decubitus, with the thighs flexed upon the abdomen, and great pain on deep pressure in severe cases. The matter ejected by vomiting, at first consists of the contents of the stomach, but afterwards of bile and mucus; and if the disease is about to terminate in gangrene, it assumes a dark, green appearance. In some malignant cases, stercoraceous vomiting occurs. The diarrhœa is of a serous or sero-purulent character, sometimes being mixed with blood. If the inflammation extends to the colon, there are also tenesmus and tormina connected with the discharges. Enteritis may terminate in resolution, gangrene, mortification and perforation. When it terminates in resolution, the pulse becomes more regular, the febrile symptoms disappear, the vomiting ceases, and the ordinary symptoms of convalescence manifest themselves. But when gangrene is the result, the pulse becomes almost imperceptible at the wrist and intermittent, the surface is covered with a cold, clammy, colliquative perspiration, the features become pinched, and the alæ nasi contract with each inspiration. The lips are purple, and the features generally cadaverous. The evacuations of the bowels become involuntary, and consist of serum mixed with blood. The urine, which has previously been scanty and high-colored, now becomes copious and limpid. The intellect usually becomes active, and, in many cases, where, during the early stage, there was delirium, previously to gangrene or mortification occurring, the patient becomes entirely sensible, and imagines himself free from the disease. As the parts lose their vitality, however, symptoms of

syncope occur, the pulse recedes from the extremities, and in a short time death closes the scene.

Causes.—Among the causes of enteritis, may be mentioned exposure to cold, rheumatism, gout and cutaneous diseases, the suppression of accustomed discharges, crude articles of food, and medicines, especially drastic purges, irritating or poisonous substances swallowed, acrid secretions from the stomach, liver, pancreas and bowels, intestinal worms, scalds and burns. It may also originate from various causes which obstruct the bowels, such as feculent or other solid accumulations, tumors, intussusception, strangulation, etc., or it may arise during the continuance of other diseases, especially typhoid fever, and other exanthematous affections.

Diagnosis.—Enteritis may be mistaken for hernia, or obstruction of the bowels. A careful examination of those portions at which hernia occurs, should be made, and the history of the case well considered. In mechanical obstruction, the symptoms advance slowly, the pain is fixed, and there is, generally, previous attacks of constipation; while, in intussusception, which is relieved upon pressure, there is colicky pain. Hysterical tympanitis, peritonitis, cerebral disease, suppression of urine, inducing sickness and constipation, have been confounded with enteritis, though such errors can only be committed by the most ignorant of the profession.

Anatomical Characters.—The mucous membrane is generally, more or less, reddened. This redness may be continuous, or in patches. The follicles may be enlarged or ulcerated on their points, and surrounded by an areola of inflammation, or several of them may coalesce, forming an irregular ulceration. Ulcers may also exist in the submucous and muscular coats, and even the serous tunic may be found ruptured. In some cases, portions of the bowels have been found dark and gangrenous, particularly when there is obstruction in which perforation occurs, allowing the escape of its contents.

Portions of false membrane adhering to the surface of the mucous membrane, are sometimes observed. The Peyerian and solitary glands remain unaffected, unless associated with exanthematous fevers.

Treatment.—The treatment of enteritis depends much upon the cause producing it. If produced by irritating ingesta, a lobelia

emetic and a large enema of warm water, will usually remove the offending substance. If produced by acrid secretions from the liver or pancreas, dram doses of a weak solution of bi-carbonate of potash, taken every two or three hours, will do much to remove the cause. I usually administer about three grains of the potassa to two ounces of water. Hot packs should be applied to the abdomen, and, during the active stage, be frequently changed. If the inflammation be associated with a malarial influence, and the fever assume an intermittent or remittent type, a full round of quinine and iron should be given at the commencement of the disease. To control the fever, from five to ten drops of the tincture of corallorhiza odontorrhiza should be administered every half hour or hour. Veratrum, and even aconite, usually has too depressing an influence upon the circulation to be administered in enteritis. If the disease be associated with eruptive fevers, macrotin, scrofularia, and the tincture of rhus radicans may be indicated. Where there is a debilitating diarrhœa, from one-sixteenth to one-eighth of a grain of opium may be administered every two or three hours, with an equal quantity of pulverized camphor. If the vomiting be a distressing symptom, four or five drops of creasote, added to a tumbler of water, and a teaspoonful given every ten or fifteen minutes, will usually relieve it. If there be a tendency to mortification or gangrene, one or two grains of triturated baptisin may be given every hour; and if there be great prostration, two or three grains of capsicum should be administered, in a wine-glass of cream, five or six times a day. The bowels should be frequently washed out by warm water injections, and the patient caused to drink frequently, large draughts of flaxseed, slippery elm or gum water. Tablespoonful doses of a solution of chlorate of potash, in the proportion of one dram to four ounces of water, has also proved a remedy of great value in some cases of enteritis. The diet should consist of rice gruel, beef tea, goat's milk and cream.

DYSENTERY.

Dysentery, colitis or bloody flux, consists of an inflammation of the mucous membrane of the colon and rectum, characterized by small mucous or bloody evacuations, tormina and tenesmus. It may occur in an acute or chronic form.

Pathology.—By many scientific observers, dysentery is supposed to commence as an affection of the tubular and solitary glands of the large intestine, which enlarge, and become filled with a jelly-like substance. After a short time, ulcerations are formed by the rupture of the glands, and the intervening mucous membrane becomes pulpy and inflamed, secreting mucus, and bleeding readily when there is any irritation. Rokitansky states that the progress of dysentery may be divided into four stages, ranging from inflammation and softening of the mucous lining of the colon, to complete mortification. Some writers think that the diseased condition is similar to that of the pharynx in diphtheritis, and that the membrane rapidly dissolves, and passes from the bowels. Whatever may be the real pathology of this affection, it is invariably associated with a specific form of inflammation, in which the glandular structure of the bowels, at first, becomes involved, and, secondly, the entire mucous surface. The muciparous follicles evidently are so affected as to essentially change their function; as no sooner is the patient seized with dysentery, than the mucous secretion of the colon and rectum becomes acrid and irritating; hence, the tenesmus. Besides, the mucus is frequently mingled with blood corpuscles, previously to any ulceration of the mucous membrane, which fact would lead us to infer that the mucous glands may become so diseased as to secrete blood corpuscles, instead of mucus; or it may be that the congestion, occurring in the muciparous capillaries, produce hæmatorrhœa, thus interfering with the normal transformation occurring in these glands.

Acute Dysentery.—The premonitory symptoms of acute dysentery are dull pains in the abdomen, loss of appetite, general uneasiness, and weariness, constipation or diarrhœa, accompanied usually with fever, although, in some mild cases, it may be slight. This disease, however, may occur suddenly, with rigors, chills, tormina, mucus and bloody evacuations. Sometimes, the febrile phenomena are developed before the local symptoms; while, again, the bloody evacuations are the first symptoms observed by the patient. In some instances, dysentery runs a mild course, continuing only a few days, while, in others, it may be one of the most violent forms of disease with which a patient can be afflicted. These different varieties may depend upon various causes, as the degree in which the disease occurs, whether simple or complicated

In the simple form, there is, usually, irregular griping pains in the abdomen, attended with frequent discharges from the bowels, by which they are somewhat relieved. These discharges are not less than ten or twelve in the course of twenty-four hours, although they frequently exceed that number to a very great degree. At first, they have scarcely any odor; but as the disease advances, they become very offensive. After a very short time, a sense of weight, burning, or other uneasiness, is experienced in the rectum, with a frequent and painful inclination to go to stool, without the power to evacuate any thing excepting a little mucus. As the disease becomes more developed, and ulceration or sloughing commences, the feeling of tenesmus is more frequent, and the ease which succeeds more transient; the evacuations are thin, mucous and bloody, and frequently mixed with small, hard, separate lumps of fæces, or *scybala*. These scanty stools soon produce distress rather than relief, and sometimes are attended with so much straining as to cause *prolapsus ani*, particularly in children. The patient is constantly tormented with tenesmus, and the stools become fetid, dark-colored, and mixed with blood and lymph. The bladder sympathizes with the rectum, causing frequent and difficult micturition. The urine is high-colored, and produces scalding when voided, and sometimes there is strangury. In females, the vagina may also be irritated. There is usually much tenderness in the abdomen, as indicated on pressure. Fever is usually present. The pulse is accelerated, full and forcible, the skin hot, harsh and dry, the thirst urgent, the tongue furred, and the papillæ prominent, the appetite lost, and there is dyspnœa and great prostration. Sometimes, there is an indescribably painful feeling of hollowness in the stomach, attended with a cold, damp skin, a feeble and almost thread-like pulse, nausea and vomiting, although, in the simple form, this is very seldom the case.

Cases of simple dysentery usually terminate favorably from the sixth to the tenth day, but the system may be so affected, as not to recover entirely. Should the disease continue longer than a week or ten days, there is generally much danger to be apprehended. The *chronic* form is characterized by frequent small evacuations, consisting principally of mucus, mingled sometimes with bile, pus, fæces and blood. The symptoms are similar to those of the acute

form, but are developed with less intensity. If the disease be confined to the lower portion of the intestines, the constitutional symptoms may be very slight. But in protracted cases, occurring in scrofulous constitutions, there are emaciation, general debility, and, unless arrested, dropsy or consumption may be the result. Dysentery, whether acute or chronic, is liable to various modifications, depending upon the condition of the patient, the time of attack, the locality, etc.

Bilious Dysentery.—In almost all cases of dysentery, the secretion of the bile is diminished, but in the simple variety, this is not the case. Occasionally, however, the liver and stomach become disordered at the commencement, when it is known as bilious dysentery.

This form is characterized by oppression in the region of the stomach, more frequent vomiting, yellowness of the tongue, skin, conjunctiva and urine, a higher grade of fever, delirium, and a morbid condition of the biliary secretion.

Adynamic Dysentery.—This form of dysentery is more liable to attack those living in camps, vessels, and besieged cities, in which they are compelled to subsist upon unwholesome food, suffer fatigue, etc. Under these circumstances, in addition to the ordinary symptoms of dysentery, we find those of a malignant, typhoid or scorbutic character, as urgent thirst, a foul, black, dry tongue, nausea and vomiting, sordes, a discolored skin, often covered with petechiæ, dark, livid spots, etc., an irregular, frequent pulse, black and offensive stools; great prostration, depression of spirits, headache, delirium, subsultus tendinum and stupor. In the worst cases, the sufferer seems to be struck with death from the very beginning of the disease. When the causes producing this variety unite with those of the bilious form, we have sometimes a combination of malignant symptoms almost unsurpassed by those of any other disorder.

Intermittent and Remittent Dysentery.—Dysentery is frequently associated with other diseases. It is not uncommon in marshy districts, and during the prevalence of intermittent and remittent fevers, to find dysentery connected, more or less, with them. They may occur at the same time, or at intervals; and may be distinguished from the simple form by the tendency to paroxysms, at

which time there is more pain in the head, delirium and nervousness.

Typhous Dysentery.—Dysentery is occasionally attendant upon typhous fever. The only essential difference in this form from other varieties of dysentery, is, that it is connected with an adynamic state of the system.

Rheumatic dysentery is another variety, differing from other forms in its modes of attack, the inflammation passing from a serous to a mucous membrane.

Epidemic dysentery is sometimes regarded as a distinct variety, but any form may become epidemic. There is, however, one mark of difference, which is, that in epidemics of this disease, the symptoms are usually more malignant.

Causes.—Dysentery may be caused by heat increasing the excitability of the mucous membrane, thus predisposing the surface to diminished action. It attacks persons who, after the heat of the day, expose themselves to the damp air of evening. It is frequently occasioned by eating unripe fruits, vegetables not easily digested, acid drinks, putrid water, drastic purges, ascites, feculent accumulations in the large intestines, exhalations from putrid animal substances, and vegetable miasma, etc. While unripe fruits, and all other substances capable of irritating the alimentary canal, are liable to produce dysentery, it is a mistaken idea that *ripe* fruits, when eaten in proper quantities, contribute to this affection, as the most ample experience has demonstrated. In the Western country, previously to the cultivation of fruits, when the people subsisted mostly upon fresh and salt meats, with but sparing quantities of vegetables, the most violent and malignant forms of dysentery frequently occurred. Again, after fruits were cultivated, several seasons in which they were destroyed by an early frost, the people suffered most extensively from this disease. Again, I observed that those families who obtained an abundance of ripe fruits from a distance, enjoyed almost a complete immunity from it. Mercurial medicines, diseases of the liver, stomach and bowels, and over-mental labor, may also be mentioned among the causes.

Anatomical Characters.—When death results from dysentery, there is always inflammation of the mucous membrane of the rectum, and the lower portion of the colon. The inflammation may

be diffused equally over the entire membrane, or it may be seated in the solitary glands. Ulcers frequently exist, and mortification of parts of the membrane. In some climates, this disease affects the liver. In chronic cases, occurring in scrofulous constitutions, abscesses and other organic changes of the liver may be observed together with extensive ulceration of the alimentary mucous membrane, and especially of the large intestine. Gangrene is most frequently observed in the adynamic variety, and the mucous membrane, when not mortified, exhibits a livid or dark purple appearance.

Prognosis.—If the disease take a favorable turn, the pain gradually diminishes, the discharges occur less frequently, leaving only a slight diarrhœa. The most unfavorable symptoms are coldness of the skin, distention of the abdomen, the absence of tormina, delirium, stupor, hiccough, involuntary stools, subsultus tendinum, etc. If the disease continue, without a favorable symptom, longer than the fourteenth day, the danger is very great. The danger is also proportionate to the extent of the colon involved; and if the inflammation extend along the entire tract, the prognosis is very unfavorable.

Treatment.—The treatment of dysentery, like that of other diseases, must essentially depend upon the cause producing it, and the circumstances under which the patient received the attack. In the commencement of the treatment, the stomach and bowels should be thoroughly emptied by a free lobelia emetic, followed by one fluid ounce, of equal parts, of compound syrup of rhei et potassa and the fluid extract of leptandria Virginica, every half hour or hour, until a free evacuation has taken place. At the same time, a large hot pack should be applied to the abdomen, and changed frequently. Immediately after the purge, from ten to twenty grains of sulphate of quinine and one dram of leptandrin should be divided into five or six powders, and one given every hour, until all are taken. During this treatment, if the patient be suffering much from the discharges and tenesmus, fifteen or twenty drops of the tincture of opium should be added to five or six ounces of starch water, and injected into the rectum. These injections should be repeated as frequently as required to arrest the pain. As soon as the patient is thus prepared for the specific medication, from ten to twenty grains of the

triturated gelsemin should be added to a tumblerful of pure water, and one teaspoonful administered every fifteen or twenty minutes. At the same time, aconite or veratrin should be given to control the fever, and the body frequently sponged in warm soda water. During the entire treatment, the patient should be in bed, and observe the re-cumbent position as nearly as possible. The diet should consist of grapes, baked apples, bread, rice coffee, beef tea and ripe fruit. In bilious dysentery, the only additional treatment required, is to administer small doses of leptandrin and leontodin, to increase the secretion of bile. In the intermittent and remittent forms, quinine and iron should be administered every two or three days, until the malarial poison is neutralized. When the disease assumes a typhoid variety, capsicum and cream, in the proportion of three grains of the former to a wineglassful of the latter, taken every two or three hours, will remove that symptom. If required, however, carbonate of ammonia, muriated tincture of iron, nitric acid, and other vegetable and mineral tonics, may be administered. In case the dysentery assume a putrid or malignant form, as it does in camps and certain epidemics, then, in addition to the above treatment, two or three drops of sulphuric acid should be given, in a wineglass of water, every hour or two; and the gelsemin may be combined with baptisin, say twenty grains of triturated gelsemin may be mixed with one dram of triturated baptisin, and made into twenty powders, and one given every half hour or hour. If there be nausea and vomiting, ten drops of hydrocyanic acid may be added to six ounces of water, and one teaspoonful given every half hour, until that symptom is controlled. It is in this form, where a decoction of the comptonia asplenifolia, in connection with a few drops of the tincture of opium, has proved of so much value as an injection. Where there is ulceration of the mucous membrane, as there is in the chronic form, one grain of nitrate of silver may be made into ten pills, with pulverized gum Arabic, and one given, in a dram of thick gum water, every hour, until all are taken. When there are ulceration and muco-purulent discharges, ten grains of the muriate of hydrastin, and twenty grains of rhusin, should be triturated, divided into ten powders, and one given every hour. In all cases where there is an adynamic state of the system, hydrastin and salacin, in combination with

iron, should be given. Where there is great prostration, and the capsicum and cream do not remove it, brandy and wine should be given in connection with it. In one case that came under my charge, after nearly all other remedies had failed, I gave the following: Take hydrastin, twenty grains; sulphate quinia, ten grains; gelsemin, one grain; and pulverized opium, two grains. Mix, and divide into twenty powders, and give one every hour. The effect was almost magical, as it arrested the discharges and removed other symptoms very rapidly. In this case, there was ulceration of the mucous membrane of the rectum and colon, great prostration, and a typhoid condition of the system. To arrest the discharges, and remove the immediate effect of the disease, there is no one remedy possessing the power of gelsemin; indeed, it is as much a specific for dysentery, as quinine is for intermittent fever, or dioscorin for bilious colic, and can be relied on in all cases; but like other specific remedies, previously to being administered, the system should be thoroughly washed and cleansed, both inside and out, the surface by soap and water, the stomach by a lobelia emetic, and the bowels by castor oil or the compound syrup of rhei et potassa and leptandrin. After this has been accomplished, and the patient placed in bed, then the gelsemin may be given, either alone or in combination with quinine and hydrastin. In all ordinary forms of the disease, ten grains of the triturated remedy, added to half a tumblerful of water, and one teaspoonful given every five or ten minutes, will arrest the discharge in a few hours. In the treatment of dysentery in children, much care should be observed not to arrest the discharges too abruptly, nor until all symptoms of inflammatory action have disappeared from the bowels; otherwise, congestion of the brain may occur. To relieve the tormina, in some forms of dysentery, while the gelsemin is removing the specific disease, five drops of equal parts of chloroform, and the tincture of aconiti folia, may be given every five or ten minutes, until this symptom is subdued; and, as we have already stated, starch water and the tincture of opium, may be administered to arrest the discharges temporarily.

DIARRHŒA.

Diarrhœa is a common disorder, characterized by frequent and urgent demands to evacuate the bowels.

Symptoms.—Diarrhœa, produced from whatever cause, is commonly preceded by a sense of indigestion, fulness of the stomach, flatulency, and more or less pains resembling those of colic. The pain generally subsides after an evacuation, and returns, as an indication of another discharge. The nature of the evacuations varies; as, in some cases, they are thick, and consist mainly of the ingesta; while, in others, they are serous, or of a rice-water appearance; and, sometimes, of disintegrated mucous membrane, blood and bile.

There may be a disagreeable sinking sensation in the abdomen, along with the discharge, with exhaustion, a cool skin, and a feeble, irregular pulse. It may be attended with fever, indicating extensive irritation of the mucous coat, although, usually, there is no febrile excitement. The urine is scanty.

The disease may be very slight, recovering in a day or two, or it may be prolonged for months. The prognosis is generally favorable in simple diarrhœa. Death has taken place, in some rare cases, from great exhaustion while at stool; but more commonly it is preceded by a slow emaciation and failing of strength.

Bilious Diarrhœa is characterized by frequent discharges, composed of serum, highly colored with either yellow or green bile. It is supposed to be produced either by the secretions from the liver being vitiated, and irritating the alimentary canal, or by a discharge of a superfluous quantity of bile into the duodenum.

Mucous Diarrhœa consists in discharges of a semi-transparent character, which, at first, are mixed with ingesta; but, afterwards, composed principally of mucus. It is produced by colds, and catarrhal affections generally.

Serous Diarrhœa is characterized by large evacuations of a thin, watery character, varying in chemical and physical constituents, as it is mixed with blood, bile, ingesta, etc.

Causes.—Diarrhœa may originate from any cause which disturbs the normal condition of the digestive apparatus, such as improper diet, either in quantity, quality or period. In some constitutions, certain articles of food, as milk, cheese, cabbage, onions, etc., produce it. It is also caused by a weak condition of the stomach; the food not being properly digested, ferments and generates irritable gases and acids. It may also exist as a symptomatic

disease, as in children who are teething. Over-mental exertion, great fatigue, and a debilitated state of the system, may also be enumerated among its causes. It is also produced by the improper use of irritating remedies.

Treatment.—When diarrhœa is produced by the fermentation of the ingesta and acrid gases, it can be controlled by administering one teaspoonful of the compound syrup of rhei et potassa every half hour or hour. If produced by the discharge of acrid bile in the duodenum, leptandrin, leontodin, bi-carbonate of potassa and xanthoxylin may be administered, either alone, or in combination with the neutralizing mixture. When the diarrhœa is of a symptomatic character, and produced by intestinal worms and other irritating substances, the cause should be removed, and small doses of neutralizing mixture, in combination with a few drops of the elixir of paregoric, be taken occasionally, until the disease is removed. If the diarrhœa be of a *serous* character, after removing the cause, ten grains of triturated colocynthin may be added to a tumbler of water, and a teaspoonful given every five or ten minutes. If this remedy should not control the disease in the course of a day or two, the same quantity of triturated jalapin should be added to a tumbler of water, and used the same as the colocynthin. When the disease occurs in children, and is of a *mucous* character, ten drops of the tincture of podophyllum peltatum, added to a tumbler of water, and a teaspoonful given every ten or fifteen minutes, is a most effectual remedy. When caused by ulceration of the bowels, from one-tenth to one-sixteenth of a grain of argenti nitras should be taken three or four times a day, in a large quantity of gum-water, and equal parts of myricin and hydrastin, in one or two grain doses, every two or three hours. Diarrhœa, associated with fevers, the latter stage of scrofulous and consumptive diseases, may be temporarily relieved by small doses of opium and camphor. When the diarrhœa is of a colliquative character, two or three ounces of the decoction of piper angustifolium or matico, given every two or three hours, will afford relief. The diet should consist of rice, coffee, toast water, and bread and milk.

OBSTRUCTION OF THE BOWELS.

Obstruction of the bowels is, usually, sudden in its attacks, but may, however, approach slowly, with the ordinary symptoms of

constipation, the patient experiencing, gradually, increasing difficulty in his evacuations until they cease. The most prominent symptoms are constant vomiting, consisting of the contents of the stomach and mucus at first, but soon becoming stercoraceous or fecal, severe pains, tympanites, violent borborygmus, hiccough, great depression of spirits, and constipation.

Palpation detects, at an early period, a feeling of fulness above the obstruction, while percussion elicits decreased resonance. The prostration generally sets in early, followed by acute peritonitis. The lower the obstruction be situated, the less urgent is the vomiting. The stercoraceous vomiting sometimes affords temporary relief, or the obstruction may be somewhat removed by an evacuation and then return, and thus a course of suffering, alternating with partial relief and reaction, may continue for months, terminating in death, or a complete removal of the obstruction and recovery. In some cases, the vomiting has a strong urinous smell.

When the symptoms above enumerated are presented, the abdomen should be closely examined, so as to ascertain whether the cause may not be strangulated hernia.

Causes.—The causes of obstruction of the bowels are an accumulation of hardened fæces, permanent stricture, foreign bodies, organic tumors, bands and adhesions from effusion of lymph, twists or displacements, formation of solid concretions in the bowels, intussusception, etc.

Intussusception, or invagination of the bowel, is a very frequent and fatal cause, in which condition, one part of the bowel is drawn into another portion, producing, in many instances, a complete closure of the cavity. The intussusception is, generally, single; the inversion is, usually, from above downwards. In the majority of cases, the ileum and cæcum are protruded into the colon. It is most common in children; while, in addition to the sickness, constipation, sudden violent pain, tympanites, vomiting, etc., there is often a discharge of blood and mucus per anum.

The inflammation may end in gangrene, and parts of the invaginated bowel may mortify and slough, leaving the canal of the intestine free. When the obstruction is due to cancerous stricture, the sigmoid flexure of the colon and the rectum are most frequently affected.

The *diagnosis* of intussusception is rather obscure at first. If the symptoms of obstruction come on suddenly, without any previous difficulty, or if it results from the use of an active purgative medicine, or as the consequence of an attack of colic, and if a tumor can be felt in any part of the colon, which was not previously detected, we may suppose that intussusception has occurred.

Twisting of the *bowel*, another cause of obstruction, is that condition in which a fold or loop turns round upon itself, and makes two entire revolutions, thus preventing the passage of the fæces. It is most apt to occur at the sigmoid flexure of the colon, or in the convolutions of the small intestines. Its existence cannot be ascertained during life; but we may conjecture that it occurs when the obstruction is sudden, and not accompanied with any discernible tumor.

Another cause of obstruction of the bowels, is strangulation, by the passage of the intestine through some abnormal opening, as mesocolic, mesenteric, diaphragmatic, or omental hernia.

Prognosis.—When the obstruction takes place in the upper portion of the small intestine, death usually occurs in from five to ten days, if proper treatment be not instituted. If, however, it occur in the lower portion, it is attended with much less pain and distress, and may not terminate fatally for several weeks. In cases apparently hopeless, a spontaneous cure sometimes takes place even at the last moment, and, consequently, the prognosis of obstruction of the bowels is most favorable when the disease is of long duration.

Treatment.—When obstruction of the bowels is incomplete, and the diagnosis uncertain, the habits and diet of the patient should be thoroughly regulated, and every effort made to support the strength and constitutional vigor of the patient. If it be suspected that the partial obstruction is dependent upon the formation of a malignant tumor in any part of the alimentary canal, two or three drops of Donovan's solution may be administered three or four times a day, and an irritating plaster placed over the site of the difficulty. If the obstruction be produced by invagination or intussusception, the patient should be placed under the influence of nitrous oxide gas or sulphuric ether, his thighs should be flexed upon the abdomen, a large stomach bougie introduced into the bowels as far as it will go, and from two to four ounces of the tincture of lobelia, in three or four quarts of warm water, should be in

jected into the bowels by means of a stomach pump. The fluid should be introduced gradually, and the bowels so manipulated as to favor its ascent to the obstructed portion. In a case of intussusception, which occurred in my practice, where all other means had failed, I succeeded in removing the obstruction by the above method of injecting the bowels. In her case, we injected about eight ounces of lobelia tincture, and six quarts of warm water. Napkins were placed at the anus, around the bougie, to prevent the escape of fluid, and the pumping was continued with much firmness until the pressure was considerable. During the introduction of the fluid into the bowels, we administered hot brandy toddy, and allowed the patient to rest at intervals for several minutes, so that the time occupied by the injection was about half an hour. The lobelia had a powerful relaxing influence, and just previously to the return of the intussuscepted bowel, it produced great nausea, relaxation and vomiting. It was during the first effort to vomit, that the obstruction was removed. This was followed by almost immediate relief. This case had been mistaken for bilious colic, and, as usual in those cases, large doses of active purgatives had been administered, so much so, that a most violent peritoneal inflammation existed at the time we were called. Previously to resorting to this treatment, hot packs may be applied over the obstructed portion, the stomach thoroughly cleansed by a lobelia emetic, and from one-eighth to one-fourth of a grain of gelsemin, and one or two grains of dioscorin administered, for the purpose of overcoming the spasmodic condition of the part.

Opium, belladonna, and hyoscyamus have been used for the same purpose. If the first effort to remove the obstruction, by injecting the bowels, should fail, it should be repeated, at intervals of five or six hours. If all these efforts prove unsuccessful, the operation of gastrotomy may be resorted to, which, although usually unsuccessful, has occasionally been followed by favorable results.

Too much care cannot be observed by the practitioner in his diagnosis, as all purgative medicines, in obstruction of the bowels, aggravate the difficulty, and may produce fatal results. If the disease continue for any length of time, there is, usually, in addition to the mechanical difficulty, peritoneal inflammation. This can be overcome by aconite, veratrum and hot packs. The vomiting, if a troublesome symptom, can be relieved by a lobelia emetic.

The strength of the patient should be supported with capsicum and cream, soft-boiled eggs, milk porridge, essence of beef, and, if required, brandy toddy.

CONSTIPATION.

By constipation, is understood a collection of excrementitious matters in some part of the intestinal tube. It may arise during the progress of any acute or chronic affection, or it may exist independently of them.

Symptoms.—Constipation is marked by the unfrequency of the evacuations of the bowels, and by the recurrence of fulness and tension in parts of the abdomen. It occurs in patients of a lax and weak habit of body, or it may arise from rigidity of the muscles and an irritable temperament. The first form is characterized by a costive, or more compact state of the fæcel excretions than natural. The constitutional symptoms are pain in the head, fullness and tension of the abdomen, a sense of mental and bodily oppression, a foul tongue, anorexia and listlessness. The functions of the stomach, liver, pancreas, etc., are imperfectly performed, the intellectual faculties are dull, the spirits depressed, the complexion sallow and pasty, the skin dry, the urine scanty: there is acidity of the stomach, with nausea, flatulency and cephalalgia. The stools are pale, clay-colored, and offensive. If the constipation continue for any length of time, it may produce hemorrhoides. In very obstinate cases, the sufferer may lose all power of exertion, be subject to frequent attacks of sick headache, palpitation of the heart, neuralgic pains, great dejection of spirits, suicidal thoughts, intellectual dementia, and, unless relieved, hypochondriasis is invariably the result. When there is an accumulation of fæcal matter, the masses may be felt through the abdominal parietes. Large masses occasionally collect about the cæcum and rectum. Sometimes large abdominal tumors are formed from an excessive quantity of retained fæces, which, in some instances, give rise to œdema or jaundice. Cases have been observed, in which the abdomen has been enormously distended, where a movement of the fæces had not been passed for ten or twelve weeks.

The fæces, in constipation, are harder and dryer than is natural, and consist of knotty lumps, which produce much pain during their passage. This fæcal matter is occasionally covered with a white

or bloody mucus, and is of an unnatural color. In some instances the urine is passed with much difficulty.

Habitual constipation gives rise to a numerous class of derangements of the system. It produces not only inflammation, distention, ulceration, and gangrene, but deranges the functions of the abdominal and pelvic viscera, impedes the abdominal circulation, extends a sympathetic irritation to the brain and heart, and finally, by deranging the blood, impairs the health, tone, and vigor of the whole system.

When it only attacks an individual occasionally, it is usually attended with drowsiness, headache, a flushed face, a foul tongue, difficulty of breathing, and gastric, urinary, and biliary derangements. Among the diseases that may be mentioned as originating from constipation of the bowels, are hemorrhoidal tumors, strangury, catarrh of the bladder, dysmenorrhœa, amenorrhœa, leucorrhœa, apoplexy, epilepsy, paralysis, dyspepsia, insanity, etc., etc.

Causes.—One of the first causes of constipation, is that of a debility of the muscular coat of the intestines. It may arise from structural disease of the intestinal coats, torpor of the colon, sedentary habits, sensual indulgences, the use of narcotics, etc. It occurs in the aged, in debilitated constitutions, in anæmic patients, in those who neglect the calls of nature, and in individuals of indolent and luxurious habits. It may also be produced by a vitiated state of the secretions concerned in the process of alimentation. It may depend upon imperfection of the diet, such as introducing into the stomach ingesta which cannot be properly dissolved in the gastric secretions, and which lacks the proper quality of nutrition.

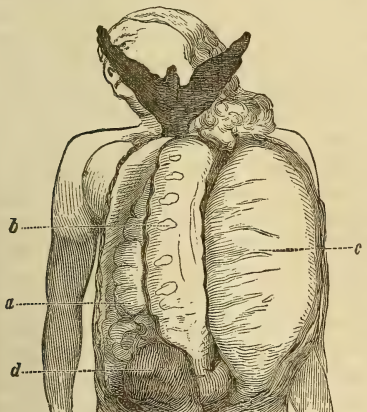


Fig. 25.

Constipation is also a very common occurrence as the result of a morbid state of the brain and nervous system. The nerves and brain when diseased, fail to impart to the bowels that amount of nervous influence essential to their healthy condition. Again, constipation may be produced by irritating medicines, and the constant use of drastic purgatives. It may also be produced by excessive secretions from other portions of the body; as when elimination is carried on by the various emunctories, if there is an excess of elimination from one, there is a proportionate diminution in another. Mental emotion, grief, anxiety, &c., also produce constipation. It may occur as the result of stricture of the rectum, or other portions of the bowels. A remarkable case is shown by Mr. Easton, in which there was an accumulation of fæcal matter in the ascending colon. (See fig. 25.)

(Fig. 25. Remarkable displacement of organs, in consequence of intestinal obstruction. *a*, Caput Coli; *b*, Ascending portion of Sigmoid Flexure; *c*, Descending portion; *d*, Gravid Uterus turned a little down.)

Treatment.—In the treatment of constipation of the bowels, the cause or causes of the difficulty should be carefully studied. If dependent upon a weak and lax state of the muscular fibres, hydrastin and iron are the remedies; let the patient take one grain of hydrastin, and two of iron by hydrogen, five or six times a day. For the present relief, the bowels may be opened with the compound podophyllin granule once a week. If dependent upon vitiated secretions of the liver, stomach, &c., tonic tea should be drunk freely during the day, and two or three grains of frazerin, and one grain of bi-carbonate of soda, taken every night at bed-time; to maintain a soluble state of the bowels, the patient should eat unbolted bread, and freely of fresh fruits. When it is produced by spinal and cerebral difficulties, the nervous affection should receive especial attention, while the bowels should be kept open by means of euonymin, in combination with cypripedin. Ten grains of euonymin, and five of cypripedin, divided into two powders, and one taken morning and night, will usually accomplish this purpose. The surface should be frequently bathed and rubbed with a coarse towel, and the patient attend to the demands of the bowels every morning. When the constipation is dependent upon stricture of the

rectum, the bowels should be moved by means of large stimulating injections, and the stricture removed by proper treatment, such as the introduction of the bougie, the use of menispermin, gelsemin, muriate of ammonia, &c. When the constipation is owing to a nervous and irritable habit, the following mixture is most valuable:—Take essential tincture of scutellaria, one ounce; essential tincture of cypripedium, pub. two ounces; essential tincture of leptandria virginica, three ounces; simple syrup, six ounces. Mix. Dose, one teaspoonful three or four times a day. The diet and habits of patients laboring under constipation of the bowels should be well regulated, and all drastic and irritating purgative medicines carefully avoided, as they tend to debilitate the alimentary canal, and in other ways to derange the system. Two or three grain pills, of equal parts of fel bovinum and the extract of Jamaica ginger, taken two or three times a day, is a valuable remedy.

CANCER OF THE BOWELS.

Cancer of the bowels may occur in any part of the intestines, but is most frequent in the duodenum, cæcum, rectum, and sigmoid flexure of the colon.

Symptoms.—The early symptoms are pain and uneasiness in the part affected, and in the spine opposite the cancerous affection. As the caliber of the intestine becomes diminished, there may be constipation; and if the duodenum be the seat, vomiting. Sharp, lancinating pains occur in the abdomen, and extend along the spine, especially after eating. When the disorder is seated in the cæcum, or below it, there is considerable abdominal distention, feculent accumulations occur, and the patient is troubled with eructations of gas. When the obstruction is extensive, there may be stercoraceous vomiting, constipation, and abdominal distention.

Diarrhœa, with bloody, glairy, gelatinous, and sanious evacuations may occur. If the disease be situated in the colon or rectum, there is distressing tenesmus. If it involve the neighboring organs, as the liver, pancreas, etc., it gives rise to serious complications of the symptoms. After ulceration commences, emaciation rapidly progresses, the countenance is cachectic, there is anorexia, the pulse becomes frequent, œdematous effusion takes place, the

pains are distressing, and the patient dies, perfectly exhausted with the loss of blood, and general irritation. Death may also result from complete obstruction of the bowel, or peritoneal inflammation.

Diagnosis.—If the disease be situated in the rectum, it may be detected by introducing the finger, which will encounter a hard, resisting mass, nearly closing the passage; if in the duodenum, by the lancinating character of the pain, occurring about three hours after eating, together with the vomiting; and if at any intervening point along the intestines, it may usually be distinguished by the countenance, the pain, and the constipation. In cancer of the rectum there is less disposition to vomit than when the upper part of the canal is affected, and less disturbance of health, until the complaint has made considerable progress. The tenesmus, tormina, the discharge of fæces in a flattened, tape-like form, and other distorted shapes, and the acute, lancinating pains in the region of the sacrum, extending down the limbs, will sufficiently indicate the necessity of an examination of the rectum, in which a stricture will be encountered. There is also an ichorous fetid discharge, and the irritation extends to the bladder in males, and to the vagina in females.

Auscultation and percussion may also aid much in the diagnosis of cancerous affections of the bowels. By auscultating the part affected, if strong arterial pulsations be heard, and if there be a tumor present, with dulness upon percussion, the intestinal difficulty may be inferred to be an aneurism of some of the abdominal arteries. On the other hand, if there be dulness upon percussion, in connection with the symptoms above enumerated, and a leaden hue of the countenance, then a cancerous affection may be inferred; but even with these symptoms the diagnosis may be uncertain until the cancerous degeneration has advanced so far as to discharge cells into the stomach or bowels, which are either vomited or passed with the fæces. It is under these circumstances that the diagnosis may be rendered positive by the microscope, as cancerous cells detected in the stomach or bowels, are a sure indication of a cancerous affection in some portion of the alimentary tube.

Anatomical Characters.—The anatomical characters presented in cancer of the intestines are similar to those of the disease when it affects the stomach. The parietes of the bowels may be thickened,

rendering the passage very small, or there may be tumors projecting into the cavity, and perhaps ulceration, of greater or less extent may be found. Frequently the disease extends to the kidneys, liver, or pancreas.

Treatment.—Cancer of the bowels, like that of the liver and other internal organs, can only be palliative. The treatment consists in supporting the strength of the patient, maintaining a healthy condition of the bowels by means of gentle laxatives, allaying the pain with opiates, and the nausea and vomiting by small doses of creasote. Where there is unmistakable existence of cancer, Donovan's solution, in two or three drop doses, every hour or two, may be given. Cyanide of potassium, in very minute doses, has been recommended as a remedy of some value in these cases.

INTESTINAL CONCRETIONS.

Intestinal concretions occur rarely in man, being more particularly confined to the lower animals. When they appear in man, they are situated chiefly in the cæcum and large intestine, though sometimes in the stomach. They consist principally of phosphate of ammonia and magnesia, with some phosphate and carbonate of lime. They are usually formed by the deposits of these salts, intermixed with animal matter, around some accidental nucleus which has entered the alimentary canal, as a fragment of imperfect ingesta, gall-stones, indurated fæces, unbroken seeds, stones of fruit, etc. Another form of these concretions is composed of a mass of short fibres, matted, or interwoven, having a somewhat soft and velvety feel. They may or may not involve a nucleus.

These concretions excite symptoms of inflammation by the pressure and distention which they occasion. They also oppose the passage of the contents of the intestines. They may exist a long time without producing any serious difficulty.

Treatment.—The diagnosis of concretions of the bowels is not usually made out until after they have been expelled; although in a few cases, where it has been tolerably ascertained that they existed previously to treatment, they have been removed by large and copious emollient injections, and the use of antispasmodics. If they should occur to any considerable extent, and produce obstruction of the bowels, much care is required in the administration of purga-

tives, otherwise fatal inflammation might ensue. Large injections of flaxseed tea, with two or three ounces of lobelia introduced into the bowels, will probably control the spasms, and remove the difficulty.

INTESTINAL WORMS.

The subject of entozoa has attracted considerable attention among the medical profession during the last few years. There is scarcely an organ or tissue of the body, in which these parasites are not found. According to the classification of the entozoist, there are five different varieties infesting the alimentary canal, viz.: *Ascaris lumbricoides; ascaris vermicularis; tricocephalus dispar; tænia solium*, and *tænia lata*. *Ascaris lumbricoides*, or *round worm*, resembles the common earth-worm, and is the most common of all the intestinal parasites. It varies in length from six to fourteen inches, and is of a whitish, yellowish, or pale-reddish color. Its body is cylindrical, tapering towards each extremity. The mouth is situated at the most slender extremity, is the shape of a triangle, and is surrounded by three tubercles. The sexes are distinct. The male is smaller and less abundant than the female, and its tail is shortly curved, while that of the latter is straight and thick. Although this worm inhabits the small intestines, yet it may pass upwards into the stomach, or downwards into the colon, and consequently be either vomited, or evacuated with the stools. They have in some instances crept into the esophagus, and then into the nostrils, and have even been found in the excrementory ducts of the liver. They are the most common between the ages of three and ten, rarely existing in old age or infancy.

These worms are not usually solitary, they may exist in great numbers; thus Dr. Hooper records a case in which a girl voided upwards of two hundred in one week. Dr. Watson mentions the case of a patient, who expelled four hundred and sixty in a fortnight; and of a soldier, who passed three hundred and sixty-seven in six days. In post-mortem examinations they are occasionally coiled together, so as to form balls or masses of considerable size. They may give rise to hepatic abscess. It was at one time supposed that these parasites were capable of perforating the intestines. What gave rise to this notion, was their escape through perforations

caused by ulceration or sloughing incidental to other morbid conditions, into the peritoneal sac, or into the vagina or bladder, or out of the body through hernial apertures.

This species of worm is propagated by ova. The body of the female contains, as estimated by Eshricht, sixty millions of eggs. They enter the intestines by means of water containing them, the production of worms takes place, and an abundance of mucus is supposed to be the nidus of their increase.

Symptoms.—The symptoms which they give rise to are usually obscure; but there may be thirst, impaired appetite, excessive flow of saliva, colic pains, tumefaction of the abdomen, itching of the nose, diarrhœa, depression of spirits, pallid countenance, fetid breath, emaciated extremities, disturbed, dreamy sleep, with grinding of the teeth, tenesmus, and irritation of the anus. The passage of these lumbrici from the stomach or bowels is frequent, and may be unaccompanied with any constitutional disorder. They rarely produce serious results, excepting when they are found in the biliary and pancreatic ducts, or the Eustachian tube or larynx. They are often passed from the bowels in cases of fever. Occasionally they give rise to convulsions, chorea, and other nervous affections.

Ascaris Vermicularis.—Oxyuris Vermicularis.—This species is commonly designated as the thread, pin, maw, or seat worm. It inhabits the large intestine, and particularly the rectum. It is very slender, and of a white color, and bears a close resemblance to a small piece of thread. The head, as in the lumbrici, has three tubercles, and the body gradually diminishes towards the tail. It is the smallest of the intestinal worms, the male not exceeding two lines in length, and the female five. The vermicular ascarides are collected in great numbers, and voided in large masses or balls, matted together with mucus. When expelled they are seen to be very lively, moving their anterior extremity swiftly and continually. They occur principally in children, but may infest adults.

Symptoms.—This species of parasites produces pruritus at the anus, tenesmus, pain in the rectum, depraved appetite, fetid breath, disturbed sleep, and picking of the nose. The pruritus is often due to an herpetic eruption, and should always excite suspicion of the existence of worms. The itching is most troublesome at night, and

occurs mostly in paroxysms. Seminal emissions, and excitation of the sexual organs may occur, and it is stated that the practice of self-abuse may originate from this source. In females the worms sometimes migrate into the vagina, occasioning pruritus, with leucorrhœa. In some instances they may even pass into the urethra, causing intolerable irritation, pruritus, and distress.

Diagnosis.—The diagnosis of ascarides is easily ascertained. On examining the stools, they are found in vast numbers adhering to the fæces, and on an ocular inspection of the anus they are generally seen. They rarely lead to any serious disorder; but they may impair the general health more or less, owing to the pruritus and loss of sleep.

Tricocephalus Dispar.—The tricocephalus dispar, or long thread worm, is a small nematode helminth, usually inhabiting the cæcum and large intestines, but may be found in the colon and in the small intestine. It is about an inch and a half to two inches in length. The capillary portion constitutes about two-thirds of the whole length of the animal. As in the preceding varieties, this also has a distinct alimentary canal, and the sexes are distinct. The male, which is usually found convoluted, is smaller than the female. This worm is of a white color, unless tinged by its food, and is often present in vast numbers, even in the intestines of healthy persons. It infests the dog, monkey, fox, and other mammalia. According to Davaine's calculations, it must be very prevalent in some localities, as he states that half of the Parisians are infested with it.

This species of parasites attracted much attention in Germany about a century ago, it having been then first observed during the prevalence of an epidemic fever, which was characterized by excessive mucous diarrhœa, supposed to be produced by these entozoa, which were found in abundance in the cæca of deceased persons. This opinion, however, was erroneous, for they had been observed in other places long before, and do not give rise to any inconvenience.

The varieties of entozoon above described are styled by helminthologists, *helminthes nematoides*, or cylindrical worms. Belonging to this class is a parasite called *anchylostoma*, or *schlerostoma duodenale*, about a third of an inch long, which has been observed in

Milan and Egypt. Its presence in the small intestines gives rise to severe chlorosis, by piercing the walls, and occasioning hemorrhage from the great number of minute punctures. In our country, this parasite is unknown. Bellingham describes another worm in this category, under the name of *ascaris alata*, or *ascaris mystax*, which is said to infest the cat.

Symptoms.—During life, no observable inconvenience is experienced from the presence of these parasites in the human body.

Tænia Solium.—Common Tapeworm, Long Tapeworm.—The tænia solium, a species of the *cestoidea* in helminthology, is distinguished by its ribbon-like form. It varies in length, being usually from five to ten feet long, but sometimes reaching sixty, and in breadth from two lines, at its narrowest part, to four or five at its broadest portion. It is composed of numerous segments or joints, which are most distinct at a distance from the head, and in the lower part of the parasite longer than they are broad, resembling, when separated, the seeds of a gourd; hence it has sometimes been called *tænia cucurbitina*, or *gourd-worm*. The root of this entozoon is small and flattened, having a projecting papilla in its centre, furnished with a double circle of hooks, surrounded by four suckers or mouths, by which it is enabled to attach itself to the mucous surface of the bowel. The segments of the animal have foramina in their margins, leading to ovaries within. The foramina are placed alternately on one side of the parasite, and on the other.

Within each segment, or joint, is contained a complicated male and female apparatus, consisting of a ramified canal, or ovarium, containing the ova, and of a minute spermatic duct. It is probably nourished by imbibition through its tissues.

The researches of Kuchenmeister have demonstrated that the tænia are the cystic entozoa known as *cysticerci* and *ecchinococci*, in a state of maturity or complete development

The *tænia lata*, *broad tapeworm*, or *bothriocephalus latus*, is the largest cestode helminth ever met with in the human subject, sometimes attaining a length of more than twenty-five feet, and nearly an inch in breadth. It is distinguished from the solitary tapeworm by the breadth of the joints, the situation of the genital organs, which are in the middle of the joints, and by the different conformation of the head. It is sometimes styled the *unarmed tænia*, as its

head is unprovided with hooklets. The form of the head is elongated, and has two lateral longitudinal depressions or fossæ, instead of suckers. Each foot of a well-developed worm contains one hundred and fifty joints, each joint possessing its own ovary and male organs; consequently, each joint is fertile, and as an ovary produces eight thousand ova, it may be supposed that ten feet of such a parasite would contain twelve million. These tæniæ are rarely met with in this country; the first kind is the most common. It exists in France, Spain, England, Germany, Greece, and Italy, the broad worm being almost unknown. They both prevail in Norway, Sweden, Poland, Finland, and Holland. The *tæniæ latæ* are chiefly noticed in Russia and Switzerland. It is supposed that the embryos of this worm may be taken into the system in drinking water. The tænia solium is attributed to the ingestion of the cysticercus cellulosæ, which is common in sheep and swine. When these entozoa exist in great numbers, they render the pork *measly*. Animal food, eaten raw, or only partially cooked, is probably the origin of the tænia solium. The cysticercus is destroyed by thorough cooking, and consequently the tapeworm will not be developed.

The tapeworm inhabits the small intestine; however, when it is of considerable length, it extends into the large intestines, and in some rare cases has almost reached the anus.

It may occur in all periods of life; but in the majority of cases, it is observed between the ages of twenty and forty years. It occurs most frequently in females.

Symptoms.—The symptoms produced by the tapeworm are pruritus at the nose and mouth, dizziness, tinnitus aurium, impaired vision, salivation, precarious appetite, indigestion, neuralgic abdominal pains, and emaciation. The most conclusive sign of the presence of parasites, is their passage through the fæces; and in this species the tapeworm generally comes off in pieces, from a single joint to several feet in length. As in the other species of worms, so in this variety the nervous system may become greatly disturbed, resulting in hysteria, hypochondriasis, convulsions, chorea, insanity, etc.

Causes.—Imperfect digestion, excessive eating, crude vegetables, unripe fruits, spoiled bread, cheese, and meat, and the flesh of diseased animals, are fruitful sources of parasitical affections. They some-

times occur epidemically. They are the most abundant in moist countries, and during a long prevalence of warm, damp weather. Persons of sedentary habits, or of a depraved condition of the system, are apt to be infested with them.

Anatomical Characters.—Parasites very seldom prove fatal. The pathological changes they produce are trivial, consisting principally of an excess of mucus, and sometimes the mucous membrane is more vascular.

Treatment.—The treatment of *lumbricoides* consists in giving from one-eighth to one grain of santonine, with equal parts of podophyllin, four or five times a day. In case the above should fail to remove the parasites in a reasonable time, one or two grains of populin may be added to each dose. The oil of worm-seed, in five or ten drop doses, followed by a full dose of castor oil, has also been extensively used. Turpentine has been employed in the same manner.

Dr. Tanner recommends the following as an infallible remedy:—Take the fluid extract of male fern, two drams; syrup of ginger, two drams; and the mucilage of tragacanth, one ounce. Mix, and give as a dose before breakfast, to be followed in four hours by a brisk purge of aloes or scammony. This prescription, we think, is better adapted to the tapeworm than the ascaris lumbricoides. A teaspoonful of table salt, dissolved in a tumbler of water, and drank in the morning, will usually not only prevent the formation of intestinal worms, but remove them when they exist. Equal parts of the fluid extract of spigelia and Alexandria senna, taken in dram doses, upon retiring, is an effectual remedy.

The following compound is one that I have long been using against this form of parasite:—Take the compound syrup of rhei et potassa, three ounces; essential tincture of artemisia absinthium, one ounce; tincture of aloes, half an ounce; fluid extract of populus tremuloides, two ounces; santonine, twenty grains. Mix. Dose, a teaspoonful every three or four hours. In case that it does not act upon the bowels, it may be followed by a purge of antibilious physic. For the *ascaris vermicularis*, take pulverized podophyllum peltatum, half an ounce; boiling water, half a pint. Make a decoction, and when cool, inject two or three ounces into the rectum once or twice a day. By this means, I have effectually cleaned the

rectum of parasites, when other remedies have failed. Ice water injected into the rectum, will also remove them. Salt and water, tincture of aloes, a decoction of worm-seed and of coffee have been used for the same purpose. Internally, santonine, spigelia, and other remedies that are recommended for lumbricoides, have been successfully used. Several cases have recently been reported of the alimentary canal being entirely freed of these parasites, by administering dram doses of the clarified Mecca oil, four or five times a day.

For the removal of the *tænia solium*, the remedies that have enjoyed the most extensive reputation are the male fern, pumpkin seed, kousso, and pomegranate root. I have removed several tapeworms, by taking the meat of four ounces of pumpkin seeds, forming them into an emulsion with simple syrup, and administering one ounce every hour on an empty stomach until all is taken. This should be followed by two ounces of castor oil, and one or two drams of spirits of turpentine, which should be repeated every half hour until brisk purging ensues. If the first effort should not succeed in removing the worm, it should be repeated in two or three days. Four or five fluidounces of the decoction of kousso may be administered at intervals of two or three hours, until three or four doses are taken. This should be followed by the castor oil and turpentine, the same as the pumpkin seed emulsion. When the male fern is administered, from half a dram to a dram of the oleo-resin should be taken every hour, until about one ounce is used. This should be followed by a brisk purge of turpentine, castor oil, or antibilious physic. Where the pomegranate is used, a decoction of five or six ounces should be drunk every hour until four or five doses are taken, and the purge given, as with the other remedies. The following is highly recommended as an anthelmintic by Dr. Tanner:—Take pulveris kamelæ, sixty grains; syrupi auranti, two fluidrams; mucilaginis tragacanthæ, half a fluidounce; aquæ, three fluidounces. Make a draught, to be taken early in the morning. A purge should be administered six hours afterwards. In all cases the medicine should be administered upon an empty stomach; and as soon as the tapeworm commences to be expelled, it should be wound around a stick, and every precaution taken to prevent its breaking, so that its entire expulsion can be secured.

ACUTE PERITONITIS.

The peritoneum, or serous membrane lining the abdominal cavities, and investing the viscera, may suffer from acute or chronic inflammation.

Symptoms.—The symptoms of the acute form during the early stage of the disease, are a feeling of lassitude, pain in the back and limbs, slight chills alternating with flushes of heat, headache, and a feeling of uneasiness in the epigastrium. As soon as febrile reaction is established, there is pain of a sharp and severe character, which extends gradually over the whole abdominal cavity. Sometimes the pain is local, and either stationary or wandering, and not unfrequently attended with a sense of heat or burning. The abdomen is very tender, the slightest pressure by the hand producing intense pain. The patient lies on his back, with his knees drawn up and the shoulders elevated, so as to relax the abdominal muscles, and take off the pressure of the bed-clothes. Besides the above phenomena, there are many others, either sympathetic, or depending on a direct propagation of the irritation to contiguous parts. Nausea, vomiting, thirst, constipation, and suppression of urine, are frequent symptoms. The face is pale and contracted, exhibiting an expression of anxiety. The respiration is oppressed, each inspiration producing an aggravation of the pain, it being carried on mainly by the expansion of the chest. The pulse is frequent, small, and tense, though in some cases full, and but little accelerated. The tongue is usually moist, and covered with a whitish or yellowish fur. The patient is often very wakeful. After a time, the abdomen ceases to be tympanitic, but remains somewhat enlarged from the effusion of serum. When a fatal termination is approaching, the abdomen becomes much distended, the pulse is feeble and quick, (one hundred and forty, or upwards,) the countenance assumes a ghastly appearance, a cold, clammy perspiration covers the body, and death occurs.

Acute peritonitis is usually rapid in its course. In fatal cases, death sometimes occurs within twenty-four hours, and generally in about a week, but occasionally the disease may continue for a month. Coma and convulsions sometimes precede the fatal issue. Occasionally the bowels give way, and a greenish or blackish matter is discharged per anum.

This variety of inflammation may be connected with a typhoid condition of the system, the inflammation being of a passive character, the pulse feeble, the tongue dark and dry, attended with great debility, delirium, hemorrhages, subsultus tendinum, coma, etc.

Puerperal peritonitis, another variety of this affection, attacks women in child-bed, usually within three or four days after delivery. The pain sometimes comes on gradually, and almost insensibly. It usually commences in the hypogastric and lumbar regions. The tenderness on pressure is also at first confined to the region of the uterus. The lochiæ are diminished or suppressed, the mammæ become flaccid, and the secretion of milk is suspended. The abdomen is at first soft and flaccid, and ultimately swells and becomes tympanitic. The effused liquid is frequently copious. The pulse is more frequent, respiration more hurried, the countenance more deeply affected, prostration of strength greater, and the progress of the disease more rapid and fatal. Severe pain in the head, vertigo, and delirium, are more frequent, and cough is a common attendant. Death, which in the severe cases occurs within a few days, is preceded by a rapid and feeble pulse, cold skin, sordes about the teeth, a dry, brown tongue, tympanitic abdomen, and vomiting and stools of black or green matter.

Causes.—Acute peritonitis may arise from the ordinary causes of inflammation, as vicissitudes of temperature, stimulating food and drink, suppression of hemorrhoidal or menstrual discharges, etc. It most frequently arises from mechanical violence, blows, falls, perforation of the stomach or intestines, the bursting of abscesses of the liver, stricture of the colon, hernia, etc. It may also arise from diseases of the womb, ovaries, or intestines, from the contamination of the blood by morbid poisons, as erysipelas, variola, etc., or from a peculiar epidemic influence, in which form it is usually of a most malignant character.

Diagnosis.—When acute peritonitis is fully developed, there is little difficulty in making a correct diagnosis. The diseases with which it may be confounded are colic, gastritis, enteritis, spasmodic and neuralgic affections. The persistent pain, the abdominal tenderness, the muscular rigidity, the tympanites, the frequent pulse, prostration, etc., sufficiently distinguish it from colic. The sharper pain and greater tenderness, the supine position, the absence of diar-

rhœa, the small and frequent pulse, and the elastic tension of the abdomen, distinguish it from mucous gastritis and enteritis.

Although rheumatism of the abdominal muscles bears a close resemblance to peritonitis, yet it may be distinguished by the difference in the pain which attends the affections. In rheumatism, the movements of the body cause pain only in certain muscles, perhaps only confined to one side of the abdomen, while in peritonitis it is apt to be diffused over the entire organ.

Anatomical Characters.—The post-mortem appearances vary according to the time at which death took place. If death has occurred early, there may be only a redness of the peritoneum. In cases of considerable duration, a fibrinous exudation occurs on the surface of the membrane, of a white, yellowish, or greenish-yellow color, generally more or less organized, forming a false membrane, connecting the opposite peritoneal surfaces. There is usually a liquid found in the cavity of the abdomen. It may be of a colorless, limpid, whey-like, sero-purulent, or bloody character, mixed with blood or pus, with fibrinous flakes floating in it.

When peritonitis has resulted from perforation of the alimentary canal, an offensive gas escapes upon opening the abdomen. The character of the liquid found varies with the organ perforated, and sometimes serves to designate the location. Stones of fruit, calculi, and biliary concretions, are sometimes found. Gangrene may be observed in cases in which the intestine has been strangulated. Pus in some instances has been formed without the peritoneum. In puerperal cases, the effusion consists of a serous, milky, or bloody fluid.

Prognosis.—Acute peritonitis is always a grave malady, involving more or less danger. In the majority of cases, the danger is greatly increased by intestinal perforation, or by co-existing affections. In uncomplicated cases, the prognosis is favorable if judicious treatment be instituted. The disease may in severe cases, destroy life within a few hours. The mode of dying, is by rapid or slow asthenia. Unfavorable prognostics are a progressive increase of the feebleness and frequency of the pulse, continual increasing prostration, cold extremities, regurgitation, hiccough, etc.

Convalescence is usually slow, owing to the persistence of the tenderness and colic pains during the progress of recovery.

Treatment.—In the commencement of an attack of acute peritonitis, the stomach should be cleansed by an active emetic, the bowels opened by a brisk purge, hot packs applied to the abdomen, and a sponge bath of hot soda water prescribed. If the disease be associated with malarial influence, the emetic and purge should be followed by one or two grains of sulphate of quinia, and two or three grains of ferro-ferricyanidum every two or three hours, until ten or fifteen grains of the former have been administered. The fever should be controlled by the tincture of veratrum viride, and the packs frequently changed. If the above treatment should not arrest the inflammation at once, a large sinapism should be applied over the abdomen, and ten grains of triturated jalapin added to a tumbler of water, and twenty grains of triturated asclepin to another. A teaspoonful of these should be given alternately every ten or fifteen minutes. If there be much pain, four or five grains of Dover's powders may be administered, or from one-fourth to one-half grain of pulverized opium once or twice a day. The patient should drink freely of an infusion of althæa officinalis, or flaxseed. If the inflammation be not subdued in the course of one or two days, the emetic and purge should be repeated, and if there be constipation, the bowels should be injected with warm water. As soon as the surface becomes thoroughly chafed from the sinapism, it should be removed, and hot packs applied.

In *puerperal* peritonitis, in addition to the above treatment, ten or fifteen drops of the tincture of ferri chloridii should be administered every two or three hours. This remedy should also be given in other forms, when the inflammation is of an asthenic character. If there be symptoms of gangrene or mortification, a poultice of yeast and vegetable charcoal, kept moist in the compound tincture of myrrh and capsicum, should be applied to the abdomen, and antiseptics, such as creasote, baptisin, and prussic acid, administered internally. When an exudation of a purulent character occurs into the peritoneal cavity, from one-half grain to one grain of iodide of ammonia, administered in a little syrup of althæa, will usually remove it. If the kidneys be inactive, from one-eighth to one-fourth of a grain of apocynin should be given two or three times a day. When the exudation becomes organized, and adhesions of the peritoneal surfaces occur, ten grains of xanthoxylin, thirty

of muriate of ammonia, and five of podophyllin, may be mixed, and divided into twenty powders, and one given every two or three hours. During convalescence, the patient should be supported by animal broths, vegetable tonics, and iron.

CHOLERA INFANTUM.

Cholera Infantum is a complaint which usually attacks children between the ages of two months and three years. It is a disease peculiar to the warm season, commencing in the first heat of the summer, and usually terminating with the cold weather of autumn; is confined mostly to cities, and prevails most extensively in its most populous portions.

Symptoms.—The attack is usually preceded by a diarrhœa, which lasts from a few days to several weeks. During its progress the stomach becomes irritable, and active vomiting and purging occur. In the more violent form of the disease, the vomiting and purging occur without any premonitory symptoms, and, in some cases, are so active as to destroy the life of the patient in a few hours; while in others it is protracted for weeks, and even months. The abdomen is usually flat when the disease first commences; but after it has existed for a short period, it more ordinarily becomes full and tense. The discharges from the stomach and the bowels are of a yellowish, thin, liquid character, although, in some cases, of a rice-water appearance. The pulse is feeble, and the skin although occasionally hot and dry, is usually cold and clammy.

Causes.—The causes of cholera infantum are probably, the hot weather, the impure air of cities, and a lack of proper nutrition. This deficiency of nutrition may consist in a want of proper nutritive material in the breast milk of the mother; or the cow's milk, upon which the child is fed, or it may be owing to a want of proper nutriment in other forms.

Treatment.—When called to treat a case in the early stage of the disease, small doses of neutralizing mixture should be frequently administered, until the diarrhœa and vomiting are arrested. Or, if this fail, take leptandrin, five grains; bi-carbonate of soda, three grains; pulverized camphor, one grain; saccharine alba, twenty grains. Mix. Dose, one every half hour, or hour, as the case

may require. If this be rejected, and fail to arrest the vomiting, the stomach and bowels should be thoroughly packed with equal parts of hot water and whiskey; and ten or fifteen drops of spirits of camphor, added to a tumbler half full of water, of which one teaspoonful should be given every five or ten minutes. As soon as the vomiting is arrested, the following powders should be given:—Take quinine, ten grains; frazerin, six grains; xanthoxylin, one grain; white sugar, twenty grains. Mix, and make ten powders. Dose, one every hour. The diet should be carefully prepared, and administered in such quality and quantity as the stomach will contain it, and will best nourish the system. If there should be a diarrhœa following the disease, from one-half teaspoonful to a teaspoonful of dysentery mixture should be given every two or three hours. One grain of pulverized camphor, five grains of hydrastin, one grain of acetate of morphia, triturated in one dram of white sugar, and made into twenty powders, and one given every hour or two, will also arrest the diarrhœa when it is of an obstinate character. When circumstances will permit, the child should be removed to the country as soon as the urgent symptoms are controlled. In chronic cases, equal parts of the hypophosphite of soda, iron, potassium and lime, say one dram of each, triturated in four ounces of simple syrup, and one dram of paregoric, of which one teaspoonful may be administered three or four times a day, will also be beneficial. Stimulating liniments may be applied to the spine and abdomen. To satiate the thirst, small lumps of ice may be held in the mouth, but cold water, to any considerable quantity, should be prohibited. Where there is great irritability of the bowels, fifteen or twenty drops of laudanum, and six ounces of starch-water, may be injected into the bowels once or twice a day. In several cases, where there has been obstinate vomiting, I have relieved it by administering five or ten drops of the tincture of ipecacuanha in a tumbler of water, and giving a teaspoonful every fifteen or twenty minutes. Great benefit has also been derived by feeding the child with equal parts of arrow root gruel and boiled milk, in which a few drops of the tincture of Jamaica ginger and geranium maculatum have been added. I once cured a bad case of cholera infantum, after all other remedies had failed, by administering a cold plunge bath twice a day, followed by stimulating liniments and brisk friction.

CHOLERA MORBUS.

Cholera morbus, or sporadic cholera, is characterized by violent purging and vomiting of bilious matter, attended usually with spasms of the abdominal muscles, griping, sickness, and a constant desire to go to stool.

An attack is usually abrupt, but in some instances it is preceded for a day or two by uneasiness and oppression in the epigastric region, anorexia, flatulency, nausea, cephalalgia, chilliness, colicy pains, etc. The attack, however, occurs generally in the night. The vomiting and purging occur in quick succession, and recur simultaneously or alternately. In the intervals between the paroxysms of vomiting, the patient suffers from nausea, dryness of the mouth and fauces, urgent thirst, great languor, and prostration. The evacuations from the stomach and bowels are usually copious, consisting at first of the ingesta and fecal contents; afterwards, of a sour, acrid, serous liquid, causing a scalding sensation in the throat. The defecations also become watery, causing a similar sensation at the anus. The vomiting is not preceded by many premonitory symptoms. It generally is violent, the contents of the stomach and bowels being ejected with great force. The purging is preceded and accompanied by severe colic pains, which are temporarily relieved by a free discharge. The abdomen, though at first voluminous, becomes contracted after repeated acts of vomiting and purging. There is slight tenderness over the abdomen, spasms of the abdominal muscles, hiccough, anxiety, restlessness, and exhaustion. The pulse is more or less accelerated, small, and feeble; the skin cool and moist, or bathed in clammy perspiration; the urine scanty or suppressed; the voice feeble, or altered in quality, or there may be aphonia. These symptoms are followed by severe cramps in the feet, calves of the legs, etc. The respiration is short and feeble, the extremities cold, eyes sunken and surrounded by a dark areola, the vomiting ceases, and the patient sinks into a state of complete exhaustion. There may sometimes be slight delirium, but usually the mental faculties are unimpaired.

The disease runs a rapid course. Death may occur within twenty-four hours, though usually an attack continues for several days. When reaction occurs, it is frequently followed by febrile excitement, and if not arrested, may assume a typhoid character.

Causes.—Hot weather, impure air, a want of nutritious diet, improper articles of food or drink, as uncooked vegetables, unripe fruits, fat pork, lobsters, crabs, sour liquors, strong mental emotions, as fear or anger, etc., sailing upon a rough sea, riding backward, or turning rapidly in a circle, congestion of the liver, and the stricture of the portal circle. Cholera morbus is not peculiar to any country, but occurs most frequently in warm climates, and among children, youth, and middle age, rather than in adults, and oftener in males than females.

Diagnosis.—The diagnosis of cholera morbus is usually made with little difficulty. It is only necessary to consider the climate, the epidemic tendency, the mode of attack, the nature of the discharges, etc.

Treatment.—The treatment of cholera morbus consists in removing the cause. When it is associated with a disordered condition of the digestive apparatus, especially when the stomach is overloaded with indigestible food, a lobelia emetic, in connection with warm ginger, or composition tea, to which soda or bicarbonate of potash has been added, will usually relieve the difficulty. As soon as the emetic has operated, the compound syrup of rhei et potassa should be administered every ten or fifteen minutes, until it produces an impression upon the bowels. Large packs should be applied to the stomach and abdomen, jugs of hot water to the feet, and lumps of ice held in the mouth to satiate the thirst. If the nausea and vomiting should still be persistent, small doses of camphor, morphia, and bicarbonate of soda, may be administered, and repeated frequently. In cases of great exhaustion, hot brandy toddy and capsicum may be required. As soon as the reaction has occurred, a full round of quinine and iron should be administered. Aconite, veratrum, and tepid bathing, may be employed to control the febrile excitement if required.

ASIATIC CHOLERA.

It is now almost universally admitted that Asiatic cholera is an *endemic* disease of India, and only occasionally prevalent as an *epidemic* scourge. In its "father-land" (so to speak) it is variously designated by the Asiatics; the Hindoos, for instance, call it *purrhee morlii*, (rapid death,) the Mahometans *eunerum vaudi*, (diarrhœa

and vomiting,) and the Arabs *el houwah*, (hurricane.) Its existence, as a pestilence, has been long known, mention having been made of it as early as 1629; and accounts of it are found in ancient Sanscrit manuscripts, as also in several Chinese writings. It does not seem, however, to have been regarded and recorded as an *epidemic* until the latter part of the seventeenth century; and the first authors who gave a description of it *as such*, were, apparently, Willis and Sydenham, the former of whom, in 1670, denominated it "*Dysinterica Aquosa Epidemica.*"

Its *source* and *cause* are traceable to a noxious malaria, arising from human decomposition, ever more or less extant on the arid sands of India, especially in the Delta of the Ganges. Its *perpetuity* and *dissemination*, moreover, are attributable to native festivals, statedly observed by the Hindoos in some localities, and by the Mahometans in others. These are always attended by thousands of devotees, hundreds, probably, already diseased, filthy, emaciated, and akin to living, moving masses of heterogeneous putrefaction. During these ceremonies, the people gather in immense crowds, subject themselves to the fatigues of exhausting journeys, encamp on the borders of stagnant streams, indulge in all the excesses of debauchery, subsist on the most loathsome kind of food, and thus induce and carry with them the endemic poison. It has been satisfactorily proved, that on one occasion this Asiatic Cholera originated at the celebration of the festival of Kourban-Beiram, the feast of sacrifices at Mecca, when upwards of a million of sheep and camels were slaughtered, the offals from which were left on the ground, in the midst of 700,000 Mahometan devotees, composed of men, women and children, some of whom died on the spot, and became putrid, because unburied; whilst the returning pilgrims conveyed to their homes, and to the villages through which they passed, the germ of this desolating pestilence. A writer in the Medical Times and Gazette states, that the people "came to this festival badly clothed, badly fed, many exhausted, and all fanatically ecstatic. To them, death had no terrors, and this common earth no future—to die, was to enter Paradise the earlier—the transition from life to death a mere dream—the prevention of death a curse rather than a blessing." They came together unprepared for any of the exigencies and necessities of life; the food and water

obtainable were insufficient for the daily increasing demand; the diseased and the deceased were uncared for, and the scourge was thus unavoidably engendered. "Into such a host as this," continues the above writer, "cast a speck of disease—producing matter which will reproduce disease—and the passively unwholesome, living mass becomes actively poisonous." It is, unfortunately, too, a *movable pest*, for they disseminate it wherever they go.

The Hindoos, moreover, collect annually, by thousands, at Allahabad, where, around the Fort, the rivers Ganges and Jumna meet, and where it is superstitiously believed an under-current of milk also flows. Here, again, and hence, again, cholera is, undoubtedly, inhaled, intensified and diffused. The Ganges (so to speak) is the burial-place of the Hindoos, the surface of its stream is their chosen grave, and as the carcasses float down the river, winding in its course, some eventually rest on a sand bank, and there, exposed to the fierce rays of a tropical sun, breed the pestilence, of which we are attempting to give a somewhat minute description.

As a general summary of its migratory course, in which three distinct epochs are observable, it has been stated that it first made its appearance in the Delta of the river Ganges, whence it has invariably taken a westward direction; but Asiatic cholera was not, apparently, regarded as an *epidemic* previously to the latter part of the seventeenth century, as before stated. In 1762, thirty thousand natives and eight hundred Europeans were carried off by it in India. About twenty years afterwards, viz., in 1781, we are told it spread disastrously among the soldiers in the British army, quartered at Gangam, on the Coromandel coast. Again, for upwards of twenty years, we learn little concerning it; but in 1816, it broke out in Jessore, a crowded, filthy Bengal city; thence travelling to Calcutta, into China and the Indian Archipelago. In the following year it also, moving in a north-west direction, travelled along the Persian Gulf till it reached the shore of the Caspian Sea; thence it crossed to the Black Sea.

In 1821, we hear of it at Muscat, in Arabia.

In 1823, it visited Astracan, the great Eastern trading port of Russia. Here it seems to have been quiescent until 1830, when it again appeared in Astracan and Orenburg, from which period it

has been persistently migratory; "the pestilence that walketh in darkness—the sickness that destroyeth in the noon-day."

It is observable, too, that its tendency has ever been to travel in the direction of the principal rivers and thoroughfares, following the tide of traffic and the stream of human intercourse. Three epochs mark its prevalence and progress; its ravages and rapidity being more extensive and cotemporaneous, attributable, no doubt, to increased facilities of communication, enlarged commercial enterprises, and the substitution of steamships for sailing vessels, and of railroads for "one-horse chaises" and other slow-moving vehicles. Thus, in 1830, it travelled through Russia into the heart of Europe; through Arabia into Egypt; and passed thence to Constantinople and Smyrna.

In 1831, several cases occurred in Sunderland, England, the infection having been brought from Hamburg; and likewise in Moscow, St. Petersburg, Cronstadt, Berlin and Vienna.

In 1832, it extended to London, first appearing in the immediate neighborhood of the shipping. From England it was conveyed to France, where, in Paris, it destroyed twenty thousand persons in one month. In this same year it was carried, in an emigrant vessel, from London to Quebec and Montreal; thence, in June, it became an epidemic in Albany and New York, *the American city* most exposed to the devastating effects of all malignant, malarial, poisonous or contagious diseases, because it has the most direct and frequent intercourse with *foreign* countries.

It appeared in July at Philadelphia and Baltimore, and reached Charleston, S. C., in November.

In the spring of 1833, it proved very fatal in Havana and Mexico; in the summer it recrossed the Atlantic, and appeared, for the *first* time, at Lisbon. It languished in Portugal during the winter months; but in the spring of 1834 it ransacked Spain, and taking a north-east course, attacked Marseilles, Toulon, Nice and Genoa, extended into Lombardy, by Coni and Turin, thence into central Italy, by Florence, and in the autumn of 1835 reached Trieste, and, as it were, thus to complete its comet-like course, traversed into the Eastern countries, from which it had invaded Europe five years before.

From this period little is heard of cholera till 1847, when it, as

its second epoch, again, as at the first, cradled in the Delta of the river Ganges, and invaded Europe. This renewal and spread may be traced (as in all previous and subsequent invasions) to the vast assemblages of native devotees at the religious festivals, which periodically occur in various parts of India. During these ceremonies the people gather in immense crowds—an ill-clad, superstitious population, enduring prolonged peregrinations, and consequent fatigue, encamping on the confines of stagnant waters or polluted streams, and indulging in all the excesses of debauchery and drunkenness. For instance, in 1848, there assembled at Tantah, near the Delta, two hundred thousand Mahometan pilgrims from all parts of Egypt and Syria; and on their dispersion, through the ever-increasing avenues of trade and travel, the disease appeared at Alexandria and Cairo; thence it swept over Europe with great rapidity, and eventually reached New York and New Orleans, whence it extended its course up the Mississippi river, reaching St. Louis and Chicago before it visited the cities on the Atlantic coast, and was more or less prevalent in England and in this country until the autumn of 1854, though its devastating effects were prolonged in the West India islands, and in South America, and some parts of Europe, during 1855 and 1856.

After a partial respite for nearly ten years, that is, in 1865, it prevailed at Mecca, Alexandria, Cairo, Constantinople, Jerusalem, along the shores of the Mediterranean and Adriatic, at Marseilles and Paris, and also in England; a few cases having occurred at Southampton, and in New York, for the third time; but up to this writing has not manifested itself in an epidemic form.

Certain facts are connected with these migratory courses, which we deem worthy of note. It has been statistically shown that the intensity of its morbid influence was by no means uniform; it seems to have exercised a capricious discrimination in selecting its points of attack, favoring some localities, geographically dissimilar both as to soil and climate, even passing over towns and cities, which lay in its track. This species of eccentricity cannot logically be accounted for, inasmuch as it has sometimes left, disinfected, certain low, damp, densely populated districts, but, on the other hand, seized as its prey the inhabitants of elevated, clean, and isolated

dwellings, thus subverting every hypothesis, and baffling all conjectures relative to what may induce, and what prevent an invasion of the malady. We are at a loss, and are unable to furnish a true solution of such mysterious phenomena in the march of cholera. These are recorded and inexplicable facts; and we find that in 1830, for instance, there was a singular immunity from this pestilence in the countries to the north and south of the parallel lines, which it followed from Odessa and Moscow. Denmark escaped entirely, Norway and Finland were not visited till 1832, and Stockholm was the only place in Sweden which suffered from the epidemic, though a trading intercourse was constantly maintained with many of the exempted localities. Another fact, also worthy of note is, that while under certain conditions, the specific poison of the disease may be wafted by currents of air, it will nevertheless make its way in opposition to even the monsoon and trade winds, so irregular and erratic has been its progress. A third fact worthy of note is, that while natural objects, such as deserts, mountains, and oceans, may temporarily impede, they cannot entirely stop its migratory movements, these are not impassable barriers.

The diagnosis of genuine Asiatic cholera is not so easy as some imagine, an attack of simple cholera morbus may be, and we believe often is mistaken for it. In both instances, many of the symptoms (as they are misnamed, for they really constitute the disease) are very similar in character, if not in severity.

In either case the patient is seized with vomiting and purging, the evacuations, at first, in cholera morbus, being of a thin, dirty yellow color—next, of an almost colorless liquid, and eventually, as in Asiatic cholera, resembling rice-water. In either case, too, the patient is considerably prostrated, the extremities become cold, and he is painfully affected with cramps, especially in the legs. There is a disordered condition of the system, which French writers and some others have termed *cholerine*, anticipating an attack, but not really amounting to Asiatic cholera. This should be noted, because it virtually is a *premonition*, and consists primarily of *diarrhœa*. This intestinal disturbance, unless properly treated and promptly relieved, in localities and among individuals where Asiatic cholera is prevalent as an epidemic, will in most instances eventually verge into the malignant affection itself; a disease, which may be

said to embrace three stages, recognising the incipient diarrhœa as the first, and consisting of a gastric derangement, frequently attended with slight colic pains, an irregular appetite, a furred tongue, a sensation of great debility, and spasmodic twitchings of the muscles. When the premonitions become more intense, assuming a more active and alarming character, the disease may be considered to have advanced to the *second stage*, and usually commences with copious and excessive watery discharges from the bowels. With this, vomiting and cramps may also be simultaneously increased, causing great oppression in the epigastrium, etc. Very little straining, for the most part, attends the evacuations, either from the stomach or bowels. The cramps may gradually extend to the abdomen and chest, while the muscles of the legs, by the spasmodic contraction of their fibres, are drawn into hard knots, causing excruciating pain. This is succeeded by a momentary relaxation; soon, however, to be followed by a repeated attack, drawing the body and limbs into various distortions. During this *second stage*, the pulse at first may be only a little affected; but, unless the disease be checked, it soon becomes frequent, feeble, fluttering, and finally, perhaps, imperceptible. The tongue is usually not much coated, but moist, and the patient experiences intense thirst, and a sense of internal heat, though the surface of the body is covered with a profuse perspiration, which increases as the case progresses. Eventually, however, the surface becomes cold, the skin, assuming a bluish color, being inelastic and shrivelled, like a washerwoman's hands. There is now an evident stagnation of the blood in the capillaries, the urinary and other glandular secretions are suppressed, and the disease, under such circumstances, may be said to have merged into the *third*, or *collapsed* stage. By the term *collapsed*, is meant that condition of the system in which the capillary circulation is almost entirely suspended, and in addition to a chilled surface, the eyes are sunken, the lips compressed, the breath icy cold, the voice husky, the nails purple, and no pulse can be felt at the wrist. The action of the heart is exceedingly feeble; and if the veins be opened at this stage, no hemorrhage will occur. The surface is covered with a cold, clammy perspiration, and presents a leaden or bluish appearance. The cheeks are hollow, the surface is wrinkled, and presents a peculiar doughy and cadaverous impression

to the touch. The evacuations usually cease; but if they continue, they become involuntary. If vomiting be present, it is associated with hiccough, and previously to death, consists of mere eructations. The cramps may continue even to the last, and it is not uncommon to find the muscles exceedingly rigid after death. The intellect is not apparently much affected; although, notwithstanding the patient is aware of his approaching fate, he manifests but little anxiety. Stupor, in some cases, is an early symptom, and as the patient reaches the collapsed state it amounts to coma. In the majority of cases, the third stage is soon followed by death. Sometimes, however, an abortive effort to reaction and rallying is manifested, and thus life is prolonged for several hours, or even days, when the patient finally succumbs to the disease. Or, as occurs in a few cases, the surface gradually increases in temperature, the diarrhœa and vomiting cease, the pulse returns to the wrist, the skin presents a more natural appearance, the secretions of the kidneys and liver are increased, the thirst, which has previously been most intense, gradually diminishes, and the patient falls asleep. Upon waking, he presents all the symptoms of a permanent reaction. This, however, by slight imprudence, either in eating or drinking, may be followed by a sudden return of the disease, collapse, and death; or the reaction may become violent, succeeded by great thirst, high fever, a dry, red tongue, a tympanitic condition of the bowels, subsultus tendinum, typhomania, and all the other symptoms associated with a malignant typhus fever. Patients may recover even from this stage of the disease, although usually it terminates fatally in the course of a few days.

Varieties.—Although the symptoms above described are those usually occurring during the disease, yet it presents much diversity of character in many epidemics, and even anomalous symptoms in the same one in different individuals. In some cases, there is an entire absence of nausea and vomiting, the patient only being troubled with a rice-water diarrhœa, speedily followed by collapse and death. In other cases, there may be obstinate constipation, with intense vomiting and cramps. Again, the diarrhœa and vomiting may be present, but the cramps absent; or the patient may be suddenly seized, as in *coup de soleil*, with congestion of the brain, convulsions, and death.

Summary.—In summing up the symptoms of cholera, in the order in which they usually occur, we may mention, first, a pale and anxious countenance; a diarrhœa, which escapes by almost involuntary and continuous jets of a rice-water character, with a spermatic odor; vomiting of a similar fluid, which also flows with great profusion from the mouth; a sensation of uneasiness and pain throughout the entire abdomen; anorexia, amounting to an entire disgust for food, associated with an inextinguishable thirst. The throat and mouth are parched, and the tongue is usually large, pale, and covered with a lightish dirty coat. The urinary secretions are scanty, and in the latter stages, almost entirely suppressed. Cramps are usually present of a most painful character, being confined principally to the abdominal muscles and those of the extremities. There is usually a dull, heavy sensation about the head, associated with tinnitus aurium. The intellectual faculties, though somewhat obtuse, are not essentially impaired. The voice is feeble, or entirely suppressed. The breath is cold, and the expired air found to be deficient in carbonic acid. The pulse, although occasionally very quick, is usually slow and feeble. The temperature of the body is diminished, frequently as much as thirty degrees below that of a normal state. The features are shrunken, the cheeks hollow, the lips purple, and of a livid tint.

Pathology.—The pathology of cholera consists in a recession of blood from the superficial or peripheral capillaries to the deep-seated ones. This internal hyperæmia of the mucous membrane of the stomach and bowels is followed by a rapid exudation of the liquor sanguinis, which is expelled from the body by vomiting and purging. Autopsy has revealed, in a few cases, a gangrene of the mucous membrane of the small intestines, and an enlarged condition of the glands of the bowels in all instances. The fluid found in the bowels is analogous in composition to the serum of the blood, and the mucous membrane presents a red and corrugated appearance. No alteration has been observed in the condition of the liver, excepting a contraction of the biliary vessels. The *blood* is largely diminished in quantity, the serum being deficient, and the corpuscles irregular in form. Upon standing, it presents a loose, brittle coagulum. When the urinary secretion has been suspended for several days, uric acid, in considerable quantities, has been

observed. The *nervous centres* are in a state of congestion, and considerably increased in volume. The kidneys and urinary organs have not been observed to present any appreciable change.

Microscopic Examinations.—Dr. Ludvic Bœhm, of Berlin, in 1849, published a paper on the "Microscopical Appearance of the Mucous Membrane of the Stomach and Bowels in Cholera." He says: "The whitish flocculi along the membranes consist of cast-off epithelium; in fact, there is a general desquamation of epithelium through the mucous surface. The blood corpuscles are found altered in form."

Vegetations like the *saccharo-myris cerevisiæ* were found, and supposed to have some connection with the disease.

Rice-water Discharges—Microscopical Examination.—The outward and physical characters of the rice-water evacuations of cholera differ in many cases, varying in color, consistence and composition. Ordinarily they resemble thin gruel rather than rice-water, being thicker and less white and transparent, but sometimes they are of a brown tinge.

After being set aside for some time, they usually let fall a deposit, the amount of which is subject to great variation; but, generally, it is considerable, forming, in some cases, as much as a fourth or a sixth of the entire bulk. In none of the samples were sporules or threads of any species of fungus present, or a peculiar body of any kind other than vibriones; and in none were well-formed cells of cylinder epithelium, that which coats the surface of the villi of the intestines, discovered.

In Dr. Hassall's microscopical examinations he found great numbers of oil globules and innumerable minute acicular crystals, some of which were free, but mostly they were aggregated in bundles in the form of rosettes and dumb-bells.

Chemical Examination of the Rice-water Evacuations.—The mean specific gravity of rice-water fluid is 1008; and this low density, which corresponds with that of the urine in its most dilute condition, is sufficient to distinguish the rice-water evacuations from the category of blood serums, which attains a very high specific gravity in cholera; for, while the serum of the healthy individual,

at the same period, is found to be 1028, that of cholera patients amounts to 1050.

An analysis of solid matters in solution in rice-water excretion, during the prevalence of the epidemic, was found to be as follows:

Water	990.67
Organic matter	2.60
Salts	6.73
	1000.00

Chemical Characters of the Rice-water Fluid.—On filtration, the fluid, in a majority of instances, upon the addition of nitric acid, yielded slight flocks resembling albumen. A precipitate likewise ensued on the addition of acetic acid and ferro-cyanide of potassium; and, generally, on the application of heat, particularly after a certain amount of evaporation, slight coagulation occurred, or a scum formed on the surface. These characters correspond with those of albumen, or at least that form of it which is found in serous fluids. Nitric acid yielded with the fluid a fine pink color, and, in some cases, with sulphuric acid a similar change in tint; from which it may be inferred that probably some of the acids of the bile were present in minute quantities.

Sugar, in some instances, has been detected, and urea has likewise been observed. No doubt all the constituents of the blood might be sought for successfully by working on sufficiently large quantities of the excretion. The chemical composition of the residue from the fluid is represented in the following table, the substance being derived from mixed cases by evaporation after filtration.

COMPOSITION OF RICE-WATER FLUID IN 20 GRAINS AND IN 100 GRS.

	Per 20 grains.	Per cent.
Organic matter	6.400	32.000
Silica	.460	2.300
Phosphate of lime	.150	.750
Insoluble lime	.100	.500
Insoluble magnesia	trace,	trace.
Soluble magnesia	.171	.855
Potassium	2.230	11.150
Sodium	4.370	21 850
Chlorine	3.180	15.900

Sulphuric acid	2.441	12.205
Phosphoric acid	.310	1.550
Carbonic acid	.380	1.900
	20.192	100.960

	Per 20 grains.	Per cent.
Organic matter	6.400	32.000
Silica	.460	2.300
Phosphate of lime	.150	.750
Carbonate of lime	.180	.900
Sulphate of potash	4.980	24.900
Triphosphate of soda	.710	3.550
Carbonate of soda	.920	4.600
Sulphate of soda	.270	1.350
Chloride of sodium	6.040	30.200
	20.110	100.550

Chemical and Microscopical Examinations of the Urine.—The first of importance is the almost constant appearance of albumen, and this condition frequently exists a long time after other symptoms of the disease have subsided. The next consideration is the occurrence in the urine of fibrinous casts and renal tubules. These are almost invariably present in the early samples of urine passed on recovery from an attack of cholera, and sometimes they are to be detected for a considerable time. Very frequently dumb-bell crystals of oxalate of lime are found imbedded within the renal tubules.

Another important particular is the occurrence of deposits in early samples of cholera urine voided. They consist of uric acid, urates, and particularly *dumb-bell* crystals of oxalate of lime.

The formation of blue pigmentary substance in urine in cases of cholera has been noticed by Heller, who bestowed upon it the name of uroglaucin.

No organic productions are present in urine when first passed; but, subsequently, the yeast plant, sugar fungus, monads, etc., etc., are developed.

The average specific gravity of urine in cholera is set down by Hassell at 1009.

Microscopical Examination of the Blood from Persons Who Died of Cholera.—The specimens were all examined a few hours after death, and, in some cases, almost immediately after dissolution.

In none of the specimens were any organic productions present, animalculæ or fungii, either living or dead.

In those specimens examined immediately after death, the blood presented its usual structural characters and peculiarities. The red and white corpuscles were of the natural form and size, and of ordinary appearance.

In specimens not examined until many hours after death, changes had taken place in both white and red corpuscles. The red globules had become smaller, and some appeared melted down and entirely dissolved. The white corpuscles were not so uniform in size, less granular than natural, and frequently containing one or two shining droplets of fatty matter.

Microscopical Examination of the Skin of persons who had died of cholera, showed nothing of importance, neither vibriones, sporules, nor threads of fungi were discovered.

Result of Microscopical Examinations Instituted by her Majesty's Command.—These investigations embrace the rice-water discharges of cholera, the blood, the urine, the epidermis, the clothes of cholera patients, as well as the water drank and the air respired.

The one great result of these investigations is to show that neither in the blood nor urine, nor on the skin or clothes, nor in the water drank, nor in the air respired, nor any organic productions, were animalculæ or fungii present, to which the origin or propagation of cholera could be attributed.

The only fluid examined which was found uniformly to contain living organic productions, was the rice-water discharge, which even while enclosed in the small intestines, swarmed with vibriones.

The presence of these vibriones exhibits at least a remarkable proneness of the contents of the small intestines to undergo rapid decomposition.

Causes.—The cause of cholera is, at yet, undetermined. A great variety of ingenious theories, however, have been promulgated. In 1849, Drs. Brinton and Swayne, of England, promulgated a theory that it was produced by a minute fungous plant, which they discovered in the water drank by cholera patients. It was afterwards

ascertained that this species of algæ was common in water when no epidemic of cholera existed. Others, among them Sir Henry Holland, maintain that cholera is produced by the diffusion of myriads of microscopic animalculæ through the atmosphere. In favor of these arguments, they adduce the fact of the minuteness of these infusorial animals, they being so small that one cubic inch of water may contain more than eight hundred million. They argue that these animalculæ may assume a poisonous character by certain influences, and thus prove the source of the disease. One thing is certain, that the researches of Von Siebold and others into the nature and character of parasitic diseases, and the great light that has been thrown upon entozoa, has led many to regard the animalculæ theory with much more favor. At all events, one fact appears to be generally settled, that is, that cholera is produced by a specific and material poison, although this fact is even denied by some, who claim that the disease cannot be propagated by any of the excretions of the body. M. Hamies and M. Foy swallowed the rice-water discharges, and injected the surface with it, without even contracting the disease or experiencing the least symptoms. Drs. Budd and Snow, however, have accumulated a vast number of facts, to show that cholera is peculiarly a disease of the stomach and bowels, and that it is always produced by the introduction of a materies morbi into the system; that this poison is contained exclusively in the discharges from the bowels, and that there is nothing exhaled from the lungs or skin capable of producing it; that the poison is not a vapor or gas, but a material substance, soluble in water, capable of being wafted in the air when dried, and carried a long way by clothing.

The circumstances under which this cholera poison, or cholerine, are most readily generated and diffused, are animal and vegetable decomposition, and filth of every kind, and whatever tends to lower the vital pores, as intemperance of all kinds, debauchery, fatigue of body and mind, imperfect food, impure air and water, fear, and depression of spirits. Warmth and moisture are conditions that favor the decomposition of animal and vegetable matter, hence, may act as exciting causes.

Contagion.—Much diversity of opinion as to the contagious character of the disease exists. From all the facts we can accumulate,

we are led to infer that cholera, like other epidemic diseases, is only rendered contagious by persons who violate the laws of hygea and dietetics.

Statistics.—On examining the statistics relative to the average mortality resulting from cholera, in every epoch and country, and among all communities, there has been a singular uniformity, it scarcely ever having been below one-third, though even one-half of those attacked have in some places and seasons, been carried off by it. In 1830, '32, the deaths in private practice on the continent of Europe and in Great Britain, were about 39½ per cent., while 57¼ per cent. of hospital cases proved fatal; this increase being solely attributable, we suspect, to the probably more dissipated habits, unhealthy tenements, unwholesome food or personal uncleanliness of the admitted inmates. In 1833–34, the per centage among the former class of patients was 38¼, and no change is noted with regard to the latter. From the official returns, copied into the daily newspapers in 1849, that at New York, 34.78 per cent. fell victims to this peculiar epidemic, the average, however, being 53.71 per cent. in the hospitals.

Treatment.—In the early or *premonitory stage* of the disease, the treatment is usually very simple, consisting of the recumbent position, and the use of some aromatic anodyne to check the discharges. A great variety of preparations for this purpose have been recommended. Dr. I. G. Jones recommends the following:—Equal parts of the tincture of opium, camphor and peppermint, one dram, to be administered every half hour, until the diarrhœa is arrested. When the stomach is overloaded with improper food, a lobelia emetic has been recommended, and successfully applied, in connection with large draughts of composition. As soon as the emetic has operated, ten or fifteen drops of the tincture of opium, and four or five of the tincture of camphor, should be administered every half hour, or oftener, if required, until the diarrhœa is controlled. A horizontal position and entire rest are indispensable in all cases. As soon as it is ascertained that the patient has an attack of cholera, the diarrhœa and vomiting should not only be stopped, but the house, clothing, and the patient, so far as practicable, disinfected. This can be accomplished by fumigating the house with sulphuric acid. An ounce or two of the acid can be

turned upon a hot shovel, in the cellar, and in each room of the house, until the fumes are perceptible throughout each apartment. The patient's room, especially, should be well fumigated, and, in most cases, a few drops of sulphuric acid and water should be drunk every few minutes. Thirty drops of sulphuric acid, four ounces of water, and three grains of sulphate of morphia, and one teaspoonful administered every fifteen or twenty minutes, will usually immediately arrest the vomiting and diarrhœa without any other treatment. Aromatic brandy has also been highly recommended, which consists of pulverized cinnamon, cloves, and gum guaiacum, of each, one ounce, best French brandy, one quart. A teaspoonful to be administered as a dose as often as necessary.

Another prescription, which has been highly recommended and very successful, is to take spirits of camphor, tincture of opium, and oil of turpentine, of each three drams, oil of peppermint, half a dram. Dose, thirty drops in brandy and water as often as required to check the diarrhœa and vomiting. Another prescription, which has been highly recommended, is common salt and capsicum, of each a teaspoonful, to be drank in hot water, as a dose, and repeated every half hour or hour, until all choleraic symptoms disappear. It is stated that the first dose is usually followed by reaction in a very short time. If the disease be more advanced, and there are rice-water discharges, with vomiting and cramps, the compound syrup of rhei et potassa, combined with small doses of camphor and laudanum, may be administered in two or three ounce doses, until the medicine appears in the dejections from the bowels. This should always be administered when the stomach and bowels are loaded with morbific matter. In some cases, it may be advisable, previously to giving the neutralizing cordial, to administer sufficient of the salt and capsicum to produce a prompt emesis. The patient should be placed in bed, jugs of hot water applied to the feet, and large, hot packs to the abdomen. Ice should be allowed in liberal quantities to satiate the thirst, and in no case should the patient take cold water. When ice cannot be obtained, frequent sips of Thompson's composition, or hot tea or coffee, may be taken to palliate the thirst.

A preparation which has been extensively used in India, to check the vomiting and diarrhœa, is the following:—Oil of anise

seed, oil of cajeput, of each, one fluid dram, Haller's acid solution, and tincture of cinnamon, of each, two drams, tincture of opium, one half dram. From twenty to forty drops may be administered every ten or fifteen minutes. Homœopathic practitioners recommend, in the early diarrhœa, cuprium, to be taken according to homœopathic doses, every ten or fifteen minutes. Veratrum album is also recommended, to be administered the same way. Sulphur is given when the diarrhœa occurs after midnight, and the discharges are yellow; phosphoric acid, if they are copious and light-colored; arsenicum, if small, frequent, and dark-colored; and camphor, if there be a tendency to collapse, and great prostration. Dr. Chapman has highly recommended the application of ice to the spine. His treatment, however, has not been followed by very successful results; mustard pastes and chafing liniments being of much more benefit. The following injection has been successfully employed:—Take starch water, two ounces; tincture of prickly ash berries, one ounce; laudanum, one dram. Mix, and use as an injection after each evacuation. Another preparation, beneficially used as a stimulant, is to take tincture of prickly ash berries, tincture of gum guaiacum, neutralizing cordial, and tincture of capsicum, of each two ounces. Dose, a teaspoonful in a little hot brandy-toddy every ten or fifteen minutes. To relieve the *spasms* and *cramps*, the following has proved most valuable:—Take gelsemin, one grain; pulverized camphor, two grains; capsicum, ten grains. Triturate and divide into five powders; one to be administered every ten or fifteen minutes, in a teaspoonful of fresh cream. Another preparation, successfully used to arrest the nausea, vomiting, diarrhœa and cramps, is to take equal parts of chloroform, tincture of capsicum, tincture of opium, and tincture of gelsemin. Dose, from ten to twenty drops every ten or fifteen minutes. Dr. Morrow, one of the pioneers of new-school medicine, who treated a large number of cases of cholera in 1849, with most unparalleled success, commenced his treatment with the following:—Take pulverized rhubarb, salaratus and peppermint plant, of each half an ounce, boiling water, one pint. Simmer for half an hour, and sweeten with white sugar, and when cold, add two or three tablespoonfuls of good French brandy. This was given in tablespoonful doses every ten or fifteen minutes, alternating with a teaspoonful of the cinnamon

gum guaiacum and clove mixture. He also placed bottles of hot water, hot bricks and stones around the patient, and caused him to be kept quiet in bed. In cases where there were violent cramps, he states that he gave teaspoonful doses of equal parts of the acetic tincture of lobelia, the tincture of prickly ash, and the tincture of blood-root, every five or ten minutes, until free vomiting ensued. He used, with great success, the preparation that we have already given, that of anise and cajeput. He employed, as an astringent, the extract of plantago cordata. Chloroform and other anæsthetics, as nitrous oxide gas and sulphuric ether, have been inhaled with great benefit in some cases. Wrapping the patient in hot blankets is also of great importance. Rubbing the extremities with the compound tincture of myrrh and capsicum, and even the administration of this preparation, in teaspoonful doses every ten or fifteen minutes, has proved very beneficial in cases of great prostration.

In addition to the above mode of treatment, many empirical plants have been suggested, such as the frequent administration of large doses of opium and calomel, the injections of sulphate of zinc, sugar of lead, kino, cajeput, tannin, geranin, and nearly every other conceivable astringent. Dr. Mudge, a surgeon in the English army, made extensive use of the emulsion of turpentine with eggs and aromatics, and found it very successful in many cases. Equal parts of lime-water and milk, to which a little brandy and a few drops of the tincture of opium have been added, has also been of great benefit.

In some stages of great prostration, one drop of hydrocyanic acid, one drop of creasote, and five of chloroform, administered in a little water, has succeeded in removing the nausea and vomiting when other remedies have failed. Dr. Stevens has highly recommended a *saline* course of treatment, which consists in giving the patient small doses of Epsom's salts, together with beef tea, sinapisms to the abdomen, friction, and artificial heat. Chlorate of potash, sub-nitrate of bismuth, carbonate of ammonia, strychnin, and large doses of quinine, have also had their advantages.

In carefully reviewing all the methods of treatment, it must be apparent to every one, that the great desideratum to be accomplished, is to restore the circulation of the blood to the surface, es-

tablish an equilibrium, and bring about a thorough and complete reaction. The remedies and plan of treatment which accomplishes this in the speediest manner, and with the least injury to the general organism, is that which is the most successful in the management of cholera. As soon as *reaction* is established, the fever should be controlled by aconite or veratrum, and frequent spongings of the body with tepid water, the blood reorganized by a liberal use of toast, coffee, cream, beef tea, well seasoned with salt, and light gruels. If there is ulceration of the bowels, dysentery, or chronic diarrhœa, gelsemin, rhusin, chlorate of potash and nitrate of silver are the remedies. To restore the action of the kidneys, acetate of potash and the fluid extract of barosma may be administered. The liver may be stimulated with leontodin, leptandrin, or irisin. The patient should have plenty of fresh air, and each evacuation from the stomach or bowels should be disinfected by adding a small quantity of sulphuric acid; and if the dejections are thrown into a water-closet or privy, it should be fumigated three or four times a day.

DISEASES OF THE RECTUM.

INFLAMMATION.

Rectitis, or inflammation of the rectum, although not a very common disease, yet sometimes occurs. It is characterized by a smarting, burning, sensation about the anus, shooting pains up the sacrum, spasmodic contractions of the sphincter ani, with tenesmus, and sometimes a discharge of blood and mucus. The inflammation may extend to the bladder, producing urethritis, or to the colon, and associated with dysentery. It is produced by venereal contamination, chancres sometimes appearing upon the anus, by fistula in ano, drastic purges, especially the mercurials, ascaris vermicularis, and injuries. There is, usually, but slight constitutional disturbance in simple inflammation of the rectum. When it originates from venereal disease, or the result of injuries, the constitutional complications may be extensive.

Treatment.—The treatment of rectitis consists in removing the

cause, and in cases produced by syphilitic virus, both the local and constitutional treatment, as in syphilitic affections of other parts, should be instituted. When dependent upon parasites of the rectum, they should be removed as directed under that head. When the result of the ordinary causes of inflammation, hot packs should be applied to the part, the bowels washed out by means of warm-water injections, and sufficient veratrum viride administered to break down the inflammatory action. If the inflammation be of a chronic character, one grain of the triturated phytolaccin, administered two or three times a day, will usually relieve it.

FOREIGN BODIES IN THE RECTUM.

We sometimes meet with cases where fruit stones, needles, pins, fragments of bone, coin, pieces of sticks, impacted fæces and other substances, are permanently lodged in the rectum. They may be removed by dilating the sphincter ani as much as possible with belladonna ointment, then introducing the finger, well lubricated, and removing the substance when it can be caught. When this cannot be accomplished, the lithotomy scoop may be used, or the sphincter may be dilated with a speculum, and the substance seized with the ordinary forceps. When impacted fæces and fruit kernels are found, they may be removed by injecting the rectum freely with mucilage of slippery elm and flaxseed, and a small quantity of the tincture of lobelia.

FISSURES AND ULCERS OF THE RECTUM.

Fissures and ulcers of the rectum, or anus, are a most painful affection, not so much from the magnitude of the disease, as the irritating and peculiar function of the part. They may be situated on the margin of the anus, or far up in the rectum. When they appear on the margin, they are more painful than when the rectum is the seat of the disease. They are characterized by smarting, burning pain, and spasm of the sphincter, especially during defecation. In case the fissure be deep-seated, the parts become extremely irritable and painful. The constitutional symptoms associated with it are congestion of the liver, constipation, dyspepsia, an irritable condition of the nervous system, irregular action of the heart, and in females, leucorrhœa, prolapsus uteri, and an irritable

state of the bladder. The *chronic* form of ulceration and fissure of the rectum is usually connected with a scrofulous and tuberculous constitution, if not produced by a specific cause, as mercury, syphilis, etc.

Diagnosis.—The diagnosis of this affection is not attended with any difficulty, although the speculum examination may be painful; and in case that it is necessary to use this instrument, as small a one as will answer the purpose should be introduced. The fissures in scrofulous and tuberculous patients are frequently long and deep-seated, while the ulcers are more superficial and extremely indolent, secreting an ichorous or sanious pus, which maintains an irritation, and frequently excoriates the parts. If the disease be allowed to advance, it usually terminates in tuberculous degeneration, which is infiltrated into the lungs, liver, and other organs of the body, producing death.

Causes.—It may be produced by syphilitic virus, and all the characteristics of syphilis may develop themselves around the anus and within the rectum. It is also caused by sedentary habits, constipation of the bowels, the presence of parasites, and foreign substances in the rectum, excessive venery, drastic purges, particularly the mercurials, injuries, the use of poisonous paper, and other substances that are irritating to the sphincter; or may be the result of repelled cutaneous eruptions. In scrofulous and tuberculous constitutions, it is liable to occur in connection with hemorrhoides, and tuberculous degeneration of the mucous membrane of the rectum.

Treatment.—When the disease is caused by syphilis, the topical and constitutional remedies for that disease should be instituted. When caused by scrofulous and tuberculous constitutions, cod liver oil, hypophosphite of iron, soda, lime and potassium, in connection with general tonics, baths, and fresh air, will contribute to the cure; while the parts should be frequently lubricated with an ointment of glycerine and muriate of hydrastia. In no case, should nitrate of silver and other caustics be applied; and I have found it not only very painful, but injurious, to make frequent use of the speculum. In case that it is produced by repelled cutaneous eruptions, juglandin and quinine should be administered, together with such other constitutional treatment as the nature of the case may

indicate. When associated with hepatic derangements and hemorrhoids, the pile electuary should be used, in teaspoonful doses, twice or three times a day. The rectum may be syringed frequently with warm water; but in all cases the syringe should be very small, and not more than an ounce injected at a time. Lime water and sweet oil have also been used beneficially, to lubricate the parts. When there are deep fissures in the rectum, I have found, by injecting an ounce of the decoction of hydrastis canadensis, three or four times a day, that the irritation is allayed, and the union of the parts facilitated. I have also used flaxseed, slippery elm, and a weak solution of bi-carbonate of potassa to advantage. When the ulcers are superficial and painful, an ointment, made of three grains of oxide of zinc, ten grains of sulphate of morphia, and one-half ounce of lard, applied three or four times a day, may prove beneficial. To remove the congestion and irritation of the part, from one-eighth to one-sixteenth of a grain of phytolaccin may be administered three or four times a day. All violent exercise should be avoided, and the bowels kept in a soluble condition by means of the "Pile Electuary."

STRICTURE OF THE RECTUM.

Stricture of the rectum may arise from chronic inflammation of the mucous membrane and the areolar tissue, or a spasmodic muscular contraction. It is indicated by obstinate constipation and painful efforts at defecation. Previously to the evacuation of the fæces, there is usually more or less blood and slime, followed by the discharge of small scybala. There are pains in the loins, back and sacrum. Usually, there is great mental depression, and, if the disease be long continued, the intellect becomes much enfeebled. Digestion is impaired, the liver inactive, the tongue furred, and the skin dry and husky. In the course of time, the mucous membrane may ulcerate, and give rise to burning pain and bloody discharges. The accumulation of fæces may become very extensive, forming a large tumor in the lower portion of the bowels. The stricture is, usually, within an inch or two of the rectum, and is easily felt with the finger, but it may occur as high as the sigmoid flexure of the colon.

Diagnosis.—Stricture of the rectum may be confounded with malignant obstruction of the bowels, or simple spasmodic contraction of the canal, produced by rectitis. It is also liable to be confounded with ovarian tumors, hemorrhoids and obstinate constipation. A careful examination into these cases, however, usually obviates this difficulty. Chronic inflammation, resulting in thickening of the mucous membrane, may occur around the entire mucous lining, or a portion of it, or a small ring of condensed tissue be produced. It may occur as the result of a formation of non-malignant tumor arising in the subcellular tissue.

Treatment.—The rectum should be thoroughly emptied by copious injections of warm water, to which a small quantity of tincture of lobelia is added. If there be inflammation, it should be controlled, as under the direction of rectitis, and the bowels kept in a soluble condition by the use of Pile Electuary. If there be thickening of the mucous and cellular tissue, a bougie should be introduced, commencing at first with those quite small, and increasing as the rectum becomes dilated, at the same time administering one-sixteenth of a grain of podophyllin and two or three grains of muriate of ammonia, three or four times a day. A pledget of lint, saturated in a decoction of sanguinaria canadensis, and introduced into the rectum once or twice a day, will frequently prove very beneficial. The practice of making small incisions, although, in some extreme cases, serviceable, is generally injurious. Suppositories of belladonna, gelsemin, and extract of lobelia have also been successfully employed in many cases. Out-door exercise, frequent sitz baths and general bathing, with a liberal vegetable diet, should also be prescribed.

PROLAPSUS OF THE RECTUM.

Prolapsus of the rectum is a disease of common occurrence, and may involve the entire structure, or only the mucous portion. In the first instance, the protrusion only occurs during defecation; but as the disease becomes more permanently established, slight exercise or exertion frequently produces it. When it is of long standing, the mucous membrane frequently becomes much thickened and indurated. In other cases, ulceration occurs, and the sphincter ani is much relaxed. Prolapsus ani is usually associated with

disease of the digestive organs, and is peculiar to persons of a feeble habit, or of a scrofulous or tuberculous constitution.

Symptoms.—The symptoms are pain in the lumbar region, nervous irritability, constipation, alternated with diarrhœa, dyspepsia, cardiac irritation and general prostration. The protusion may be slight, involving only a small portion of the rectum, or the inverted bowels may prolapse for five or six inches. It more frequently occurs in children than adults.

Treatment.—In the first instance, the bowels should be returned. This can usually be accomplished without much difficulty by a little pressure. In some instances, however, it will be necessary to place the patient in a hot sitz bath, then, by gentle manipulation, return the bowels. After they are returned, if the tendency to protrusion be great, a pad of lint may be placed over the rectum, and the buttocks firmly united by broad strips of adhesive plaster. This being accomplished, the cause of the difficulty should be sought for and removed. The bowels should be well toned by the free use of hydrastin, frazerin, leontodin and iron. In some cases, the Pile Electuary, administered in teaspoonful doses, three or four times a day, will prove of the greatest value. Frequent cold sitz baths, and a good nourishing diet, are also indispensable in this disease. A suppository, made of equal parts of hydrastin, myricin and sanguinarin, with lard, introduced into the rectum three or four times a day, will also prove serviceable. Injections of alum, sulphate of iron, tannin, oak bark, hydrastis, tincture of perchloride of iron, have sometimes been used with benefit. In a few cases, I have successfully removed the difficulty by sprinkling the protruded bowels with finely pulverized sanguinaria canadensis, and immediately returning them. Astringent ointments have also been highly recommended, especially that of the oxide of zinc. When used, it should be applied while the bowel is protruded. When medicinal means fail, the most successful surgical interference consists in taking up, at different points, small folds of the prolapsed mucous membrane and ligating them at their base. When this operation is performed, a full dose of opium should be administered, and the patient remain quiet in bed for several days. Caustics, such as nitrate of silver, nitric acid, and the actual cautery have also been applied, and sometimes beneficially. Owing to

the specific influence of phytolaccin over inflammatory affections of the rectum, it is important to administer from one-fourth to one-eighth of a grain three or four times in all cases where there is inflammation.

POLYPUS OF THE RECTUM.

Polypus of the rectum consists of a pedunculated growth of a soft, pultaceous nature, adhering to the mucous membrane, and protruding when the bowels are moved. It can be removed by applying a ligature, or clipping it off with the scissors. Other tumors may also occur about the rectum, usually requiring surgical interference.

FISTULA IN ANO.

Fistula in ano consists of an abscess occurring in some portion of the cellular tissue around the anus. There are two varieties, the complete and incomplete; the complete, when the probe can be introduced from the external fistulous opening into the bowels, the *incomplete*, where the mucous membrane is not perforated.

The symptoms are usually those of a dull, heavy, throbbing pain about the sacrum and anus; and if the abscess be deep-seated, chills, followed by fever, a hot skin, quick pulse, thirst, constipation, and great tenderness in the neighborhood of the abscess. As the inflammation advances, the parts become swollen, hard, and extremely tender. The pain varies much in different individuals; in some, it is most excruciating, while in others, it is scarcely felt. As suppuration occurs, the tumor fluctuates, and if not opened by the surgeon, will, sooner or later, make its way to the surface and discharge its contents. The discharge is usually copious at first, consisting of pus and blood. As the affection becomes more chronic, it is of a sanious character; and where it communicates with the bowels, small portions of fæcal matter may escape through the fistulous opening. In time, the edges become indurated, and the surface calloused as far back as the pouches, which may consist of one or more, lined with a semi-serous membrane, that secretes the ichorous matter discharged.

In other cases, extensive sloughing of the part occurs, and deep, ragged, indolent ulcers exist around the anus. These ulcers may extend to the tissue of the nates, pus accumulate, and large ingui-

nal abscesses form. Several cases of this kind have occurred in my practice.

Causes.—Fistula in ano is more liable to occur in persons of a weak, strumous or scrofulous condition. It is sometimes produced by tuberculous infiltration into the cellular tissue of the rectum, converted into ichorous pus, and maintains a constant discharge. This evacuation of a scrofulous or tuberculous matter through a fistulous abscess, is supposed by many to exert a diverting influence upon tuberculous deposition into the pulmonary tissue. This opinion is founded upon the fact, that whenever fistulous openings are abruptly closed in phthisical patients, not unfrequently active tuberculous infiltration occurs into the lungs. It may also be caused by foreign substances lodging into the rectum, as fruit stones, pieces of wood, etc. Injuries or contusions have also produced fistula. It may result from long-continued hemorrhoids, or the presence of entozoa in the rectum.

Treatment.—During the active inflammatory state, the bowels should be evacuated with citrate of magnesia, or some mild purge, and hot packs applied to the part and frequently changed. If the pain be very severe, an opiate should be administered; and if there be extensive inflammation, with œdema, large flaxseed poultices applied, and kept constantly moistened, in equal parts of the tincture of lobelia and of opium. As soon as fluctuation occurs, or there are evidences of the existence of pus in any considerable quantity, a free incision should be made, and the pus allowed to escape. As soon as the pus is evacuated, it should be syringed with a weak solution of oxide of zinc, and the parts brought in apposition by means of adhesive strips. Strict rest should be enjoined. The injections should be repeated two or three times a day until the abscess is healed. In feeble, scrofulous constitutions, iron, cod liver oil and general tonics will be required. In the chronic form of the disease, when the fistulous opening has become completely cicatrized, and extends through the bowels, I have been in the habit of establishing inflammation, breaking down indolent walls, and producing adhesive inflammation and cure, by first injecting the rectum with mucilage of flaxseed or slippery elm, then the fistulous opening, with a strong solution of sulphate of zinc. I ordinarily use two drams to an ounce of water. As soon as the injec-

tion has escaped, the parts should be brought together by adhesive strips, and the patient kept quiet in bed. In some instances, it may be necessary to repeat the injections. In some cases, I have effected a cure by a single injection and a fortnight's rest. When the fistulous opening does not communicate with the bowels, it is not essential to inject the rectum; and if there are several sinuses, it may be necessary to inject them by means of a small cannula. The bowels should be kept open during the treatment, and all constitutional symptoms met by proper remedies. In cases of a scrofulous or tuberculous constitution, a thorough constitutional treatment should be prosecuted for several weeks previously to healing the fistulous opening.

The surgical treatment consists in the introduction of a ligature through the fistulous opening into the bowels, and out the anus, securing it to a small piece of cork, and twisting it once or twice a day, until it cuts through; or by lubricating the finger, introducing it into the rectum, and inserting a sharp-pointed bistoury into the fistula until it comes in contact with the point of the finger in the rectum, at which time the finger should be withdrawn, and the bistoury at the same time, holding the point of the bistoury firmly against the finger, and cutting downwards and outwards, until the parts are entirely separated by the wound. This wound should be dressed with stimulating and astringent washings, both in the treatment by ligature and the knife. Entire rest should be enjoined, and the constitutional treatment the same as with the caustic application.

HEMORRHOIDS.

By hemorrhoids, or piles, is understood that condition of the rectum characterized by varix of the hemorrhoidal veins, and the formation of small excrescences within the rectum and around the anus. Piles may be situated internally or externally. The pile tumors are mostly composed of vascular erectile tissue, and a varicose condition of a plexus of hemorrhoidal veins. They are usually formed by an accumulation of blood in small branches of the veins, which coagulates and forms a complete obstruction to the venous circulation. This results in engorgement, and inflammation of the coats of the vessels and surrounding tissue. The fibrous or medullary portion of the tumor is the result of the trans-

formations occurring in the exudation produced by inflammation. There may be but a single pile tumor, or a large number of them, varying in size from that of a pea to a hen's egg. Sometimes they are confined, externally, to the anus, being the result of a protruded portion of the mucous membrane; but more frequently they are concealed within the rectum, and only protrude during defecation. At other times, they exist higher up the rectum, and never make their appearance externally. These varicose hemorrhoidal veins may rupture, and give rise to extensive hemorrhage. These hemorrhages may occur at each evacuation of the bowels, or may exist periodically. In some instances, the tumors undergo degeneration, and terminate in malignant or extensive ulceration.

Causes.—Hemorrhoids are more frequent in persons of a sedentary habit, and a bilious temperament, than others, and are said to be more common in women than men. They are frequently caused by obstruction to the circulation in the portal circle, especially in the return of venous blood to the liver. It can readily be perceived, by a glance at the anatomical arrangement of the venæ portæ, how congestion, hypertrophy, and other morbid conditions may offer resistance to the return of the blood of the portal vein to the liver as it enters the transverse fissure. They are also produced by drastic purgatives, habitual constipation, pregnancy, abdominal tumors, inflammation of the vagina, misplacements of the uterus, disease of the bladder, and parasites in the rectum.

Treatment.—External piles are readily cured by clipping off the tumor, close to the anus, with a pair of curved scissors. The operation is seldom attended with much hemorrhage. If an artery, however, be observed bleeding, it should be ligated. As soon as the operation is performed, the patient should be placed in bed, the bowels kept open by means of the Pile Electuary, and an ointment applied to the anus, composed of ten grains of hydrastin, five of sulphate of zinc, five of pulverized opium, and an ounce of lard. This treatment will usually cause the wound to heal, and in the course of a week or ten days effect a cure. If there be inflammation and swelling, they can be controlled by hot packs, sitz baths, and warm emollient poultices.

In internal piles, when there is much tumefaction and tenderness, the bowels should be thoroughly opened with equal parts of

the compound syrup of rhei et potassa and the fluid extract of leptandria virginica, and cold or ice water injections introduced into the rectum. If there is much inflammation, from one-fourth to one-half of a grain of phytolaccin should be administered every two or three hours. Phytolaccin is a remedy that acts specifically upon the mucous membrane of the rectum, controlling inflammation. When the liver is involved in the difficulty, leptandrin, leontodin, and podophyllin are the remedies to be resorted to. In the early formation of internal hemorrhoidal tumors, all that is frequently required, in addition to small doses of Pile Electuary, three or four times a day, is to lubricate the finger with glycerine, introduce it into the rectum, and press out the accumulated blood after each evacuation of the bowels. Various injections have also been resorted to, such as a solution of tinctura ferri chloridi, matico, tannic acid, alum, geranium maculatum, and many other astringent preparations. Pile ointments are also extensively used, composed of sulphate and oxide of zinc, stramonium, belladonna, tobacco, and many other vegetable and narcotic astringents. The application of ice has been highly recommended by some, especially when there is much inflammation and swelling. Removing the tumor with ligatures, the actual cautery or the knife, have also been resorted to. The most common surgical manipulation, however, and freest from hemorrhage, is the ligature. This is performed by forcing out the pile tumor, firmly ligating it, attaching the ligature to a cork, and twisting it several times a day until the tumor is removed. Opium and anodynes are, usually, administered to allay pain.

During the treatment, injecting the rectum with a strong decoction of hydrastis canadensis, three or four times a day, will aid much in giving tone and vigor to the part. Cold sitz baths, and a thorough constitutional, invigorating course of treatment, is necessary in all cases. If there be hemorrhage, it can be arrested by injecting the rectum with a strong decoction of nymphæ odorata or matico.

The treatment for carcinoma of the rectum is considered under the head of cancerous affections generally.

SECTION VIII.

DISEASES OF THE ABSORBENT SYSTEM.

INFLAMMATION OF THE ABSORBENTS.

Lymphangeitis, angeioleucitis or inflammation of the absorbents is produced by the absorption of poisonous virus, or by an injury to the vessels. The best examples of lymphangeitis are exhibited in carbuncles, abscesses, punctured wounds, and in all accidents in which the injured portion assumes an erysipelatous character.

Symptoms.—The inflammatory course extends upward from the wound, in the direction of the lymphatics, in the formation of bright, reddish streaks. These streaks are very tender to the touch, and hard, like cords. The inflammation rapidly extends until it reaches the lymphatic glands, which become swollen and intensely painful, while the part is rendered puffy and tender. It sometimes extends to the cellular tissue and the whole neighboring parts, giving rise to an erysipelatous redness, and producing great soreness and burning pain.

The constitutional disturbance varies with the severity of the inflammation. The phenomena usually exhibited are rigors or chills, a frequent and full pulse, a coated tongue, anorexia, thirst, nausea, constipation, night sweats, restlessness, despondency and prostration. There may be, in some instances, vomiting and slight delirium. In cases, resulting from dissecting wounds, the fever is of a typhoid character, and may rage in a violent form.

The inflammation may terminate in resolution, or suppuration, with the formation of large abscesses, occupying the seats of previous hardness, or the pus may be infiltrated around the lymphatics and ganglia; or it may assume a chronic character, producing

induration; or may lead to fatal exhaustion or death by ichorrhæmia. Mortification occurs rarely, excepting in the aged, and in those whose constitutions are worn out by disease. Occasionally, erysipelas or phlebitis may be associated with the inflammation.

Lymphangeitis may occur in any part of the body, but is most frequent in the extremities, particularly the upper. When it occurs in the arm, it extends upward on the inside to the glands of the axilla, and often spreading to the chest, produces extensive erysipelatous inflammation.

Anatomical Characters.—There are induration of the coats of the absorbents, tenderness, infiltration of the cellular tissue, softening of the internal tunic, and sometimes an entire destruction of the vessels, together with the adjacent tissues.

Treatment.—When the disease is produced by the absorption of poisonous virus, as is the case in dissecting wounds, etc., the wound should be enlarged and thoroughly cauterized, either with sulphuric acid, caustic of potash, nitrate of silver, or sulphate of zinc. Then a hot elm poultice should be applied, and kept constantly moistened with the compound tincture of myrrh and lobelia. The poultice should be of sufficient magnitude to cover the entire inflamed part. Immediately after the application of the poultice, a thorough lobelia emetic should be administered, followed by an active purge. If the virus absorbed be of a zymotic character, five or ten drops of sulphuric acid should be administered every half-hour or hour in two or three ounces of water. The fever, if of an adynamic character, should be controlled with the tincture of corollorhiza odontorrhiza or aconite; if of a sthenic, with the tincture of veratrum viride. As soon as the active symptoms are controlled, a full round of prussiate of iron and quinine should be given.

When abscesses have formed, they should be opened by making free incisions, and the cavity injected with a moderately strong solution of sulphate of zinc or sulphuric acid, when the poultice may be applied and moistened as previously described. The strength of the patient should be well supported with tonics, wine, and a nutritious diet, and the bowels maintained in an active condition, by administering one-half dram to a dram of sulphate of soda three or four times a day. When the disease originates from a constitutional cachexia, or is of a sub-acute character, chimaphillin, ampe-

lopsin, and tinctura ferri chloridi, cod liver oil, Mecca oil, and a general hygienic course of treatment, will overcome the difficulty.

LYMPHADENITIS.

Lymphadenitis, or inflammation of the absorbent glands, may occur in all parts of the body. The most frequent occurrence, however, is in the regions of the groin, neck and axilla. It may be an accompaniment of lymphangeitis, or exist as an independent affection.

Symptoms.—The affected gland becomes swollen, hard and painful. The inflammation usually extends to the sub-cellular tissue; not unfrequently several glands are inflamed, in which case the tumor becomes much enlarged. If the disease is of an acute character, if not arrested in a course of from one to two weeks, it may result in suppuration. The skin becomes absorbed, and the abscess is opened spontaneously. If it be a simple inflammation of one or more of the lymphatics, unattended by constitutional symptoms, the abscess, after discharging, will frequently heal; or if it does not heal spontaneously, it can easily be effected by the use of proper remedies.

When the inflammation is of a chronic character, it is usually connected with a scrofulous or tuberculous constitution; and instead of the tumor depending upon ordinary inflammation and infiltration of liquor sanguinis into the gland, it is characterized by tuberculous and scrofulous deposits. In these cases, the swelling is more gradual, and the gland presents a hard and indurated appearance. In the course of time, the glands generally suppurate, and instead of healthy pus, a thin, ichorous or tuberculous discharge occurs, which continues for a long period. In some cases, the swelling degenerates into an indolent ulcer, which manifests but little disposition to heal. The constitutional symptoms are usually those connected with scrofulous or tuberculous disease, such as pallor, feeble digestion, and a weak and exhausted state of the system.

Causes.—The causes of inflammation of the absorbent glands are the absorption of syphilitic and gonorrhœal virus, as well as all others which give rise to inflammation of the vessels.

Anatomical Characters.—In the early stage of the inflammation, the tissue of the gland is firm, dense and homogeneous, presenting

upon its cut surface numerous dark-reddish points; but in the more advanced state, it is dark red, is torn easily, and more or less infiltrated with effused blood. When suppuration occurs, it is softened, and exhibits small cavities containing a viscid, serous fluid, which gradually enlarge, and at length are filled with pus.

Prognosis.—The prognosis is, usually, favorable. When proper treatment has been adopted in the early stage, resolution is generally effected; but if the skin has assumed a reddish hue, or the slightest fluctuation can be perceived, the disease rapidly terminates in suppuration, and efforts should be made rather to the hastening of this result than preventing its progress.

Treatment.—When it is produced by syphilitic or gonorrhœal contamination, a thorough constitutional course of treatment for those diseases should be at once instituted. A local application should also be made of the following:—Take aqua calcis, two ounces; oleum olivæ, two ounces; tincture of iodine, one ounce. Pledgets of lint should be moistened with this compound, and constantly applied to the inflamed lymphatic gland. When it is associated with a scrofulous or tubuculous constitution, alnuin, chimaphillin, hypophosphite of iron, cod liver oil, and wine, are remedies of great value. A favorite prescription of mine, and one which I have found of great value in this disease, is the following:—Take ferri hypophosphite, one dram; chimaphillin and ampelopsin, of each, one-half dram; chloride of sodium, two drams; phosphate of lime, one dram; cod liver oil, two ounces; simple syrup, four ounces. Mix, and administer a teaspoonful in one or two ounces of Port wine, four or five times a day. Stramonium, celandine, belladonna, and iodine ointments, may be applied to the swollen, indurated gland, or the following ointment used:—Take iodide of lead, one dram; extract of stramonium, two drams; pulverized opium, one-half dram; adeps, one ounce. Mix, and form an ointment, and apply frequently. When the glands are inflamed and painful, hot packs may be applied, and frequently changed. In some cases, where there is extensive induration of the glands, drachm doses of the compound syrup of frostwort, and one or two grains of iodide of ammonia, may be administered three or four times a day. The syrup of ceanothus Americanus and iodide of potassium, has also been extensively used in this disease. Two or

three drops of nitro-muriatic or sulphuric acid, taken two or three times a day, will frequently prove of great value. The diet should be of a strong, nutritious character, and, if practicable, associated with sea-bathing.

SCROFULA.

Scrofula, says Ericksen, "is a peculiar constitutional condition, either hereditary or acquired, characterized by the presence of tubercles" when fully developed. It is, however, only when fully developed, that scrofula gives rise to the local deposit of tuberculous matter. The constitutional condition that tends to this is sufficiently characteristic; but although we may recognize its existence, and speak of the individual possessing such a constitution, as having a scrofulous tendency or diathesis, he can scarcely be considered to labor under the fully formed disease, unless tubercle be deposited in some of the tissues or organs. The scrofulous diathesis is a peculiar constitutional state that is often erroneously confounded with general debility. It may, and often does co-exist with this, but is by no means synonymous with weakness of constitution. Debility often exists without any scrofulous tendency or taint, more particularly in individuals of the nervous temperament; many delicate people, though weak, being perfectly healthy, and showing no disposition to this peculiar affection; on the contrary, the scrofulous tendency is often conjoined with much muscular power and mental activity, no weakness being manifested in either of these respects. Scrofula is invariably conjoined with debility and a perversion of the nutritive functions of the organism. This is especially manifested in certain tissues, such as the mucous and cutaneous, and in those organs the vitality of which is low, as the lymphatic glands, the bones and joints. In these, scrofula is especially apt to influence the products of nutrition and of inflammation, more particularly during the earlier periods of life, when these actions are most energetic, in such a way as to render its existence evident to the surgeon. It is this tendency to the occurrence of particular diseases, and to the engrafting of special characters on affections of certain tissues, that may be considered as specially indicative of the scrofulous diathesis, of that condition which, in its fulness of development, gives rise to deposits of tubercle in the organs and tissues.

The existence of this diathesis is marked by the presence of a peculiar temperament, by special modifications of the seat, form, and products of inflammation, and, lastly, by the development of tubercle.

The scrofulous temperament assumes two distinct forms, and each of these presents two varieties. The most common is that which occurs in persons with fair, soft, and transparent skin, having clear blue eyes, with large pupils, light hair, tapering fingers, and clear white teeth; indeed, whose beauty is often striking, especially in early life, being dependent rather on roundness of outline than grace of form, and whose growth is rapid and precocious. In these individuals the affections are strong, and the procreative powers considerable; the mental activity is great, and usually characterized by much delicacy and softness of feeling, and vivacity of intellect. Indeed, it would appear that the nutritive, procreative, and mental powers are rapidly and energetically developed in early life, but become proportionably and prematurely exhausted. In another variety of the fair scrofulous temperament, we find a coarse skin, short and rounded features, light grey eyes, crisp and curling sandy hair, a short and somewhat ungainly stature, and clubbed fingers; but not uncommonly, as in the former variety, great and early mental activity, and occasionally much muscular strength.

In the dark form of the scrofulous temperament, we usually find a somewhat heavy, sullen, and forbidding appearance; a dark, coarse, sallow, greasy-looking skin; short, thick, and harsh curly hair; a small stature, but often a degree of torpor or languor of the mental faculties, though the powers of intellect are sometimes remarkably developed. The other dark strumous temperament is characterized by clear, dark eyes, fine hair, a sallow skin, and by mental and physical organization which closely resembles the first described variety of the fair strumous diathesis.

In all these varieties of temperament, the digestive organs will be found weak and irritable. This condition, which, I believe, is invariably associated with struma, and the importance of which has been pointed out by Sir James Clark, must be regarded as one of the most essential conditions connected with scrofula, and as tending greatly to that impairment of nutrition which is so frequent

in this state. This gastric irritability is especially characterized by the tongue, even in young children, being habitually coated towards the root with a thick, white fur, through which elongated papillæ project, constituting the pipped or strawberry tongue; the edges and tip, as well as the lips, being of a bright-red color. This state of the tongue is aggravated by stimulants, high living, and the habitual use of purgatives. In the fair varieties, the bowels are usually somewhat loose; but in the dark forms of struma, there is a torpid condition of the intestinal canal. In all cases, the appetite is variable, the action of the heart is feeble and irritable, the blood thin and watery, the urine sedimentous, and coldness, or even clamminess of the extremities.

One of the most marked characteristics of struma, is certainly the peculiar modification that inflammation undergoes, whether we regard the course that it takes, the form that it assumes, its products, or its locality. The inflammatory course, in strumous subjects, is always slow, feeble, and illy developed, the more active and sthenic conditions being rarely met. In its form, it is either ulcerative, congestive, or suppurative, and in its products is characterized by little tendency to adhesion, by the production of thin, weak, blue, and illy-developed cicatrices, and by the formation of thin, curdy pus, with much shreddy, corpuscular lymph.

The seat of strumous inflammation varies greatly; the peculiar modifications of its course, form and products are assumed, according to the part that it affects. The tissues implicated by it are chiefly the skin and mucous membranes, the joints and the bones; occasioning a great variety of special diseases, according as one or another of these structures is affected. It is as the result of, or in connection with these local affections, that the general symptoms of struma become most marked. Whatever the temperament may be, the individual becomes emaciated, sallow, cachectic and debilitated, and at length falls into a state of hectic fever or marasmus.

When affecting the skin, scrofula presents itself under a variety of cutaneous eruptions, especially the different forms of eczema of the scalp, and various ulcers on the surface, usually weak and largely granulating, with considerable swelling of surrounding parts, and a tendency to the formation of thin, blue, and glazed cicatrices.

The *mucous membranes* are commonly extensively affected, and often present the earlier forms of scrofulous disease in childhood. This is more especially the case with those of the eyelids and nose. The conjunctiva becomes chronically inflamed, with, perhaps, ulceration of the cornea; the mucous membrane of the eyelids may be permanently congested and irritated, with loss of eyelashes, constituting the different forms of psorophthalmia. The mucous membrane lining the nostrils becomes chronically congested, red and swollen, giving rise to habitual sniffling of the nose, and to a sensation as of a constant cold. Occasionally, the lining of the antrum becomes irritated, occasioning an enlargement of this cavity, or the discharge of unhealthy pus into the nostrils. The tonsils may be chronically enlarged and indurated, with occasional tendency to fresh inflammation; and the larynx may become the seat of various forms of aphonia, dependent on congestion of its lining membrane. The condition of the gastro-intestinal mucous membrane has already been described when speaking of the state of the tongue; and that of the genito-urinary organs is also marked by a tendency to debility and irritation, indicated by the occurrence of discharges from the urethra, under the influence of very slight exciting causes that are often permanent in their character. The occurrence of calculus in the bladder, especially in children, may occasionally be attributed to the scrofulous diathesis.

Perhaps the most important local diseases arising under the influence of this agency, are those of *the bones and joints.* The bones are liable to the occurrence of various forms of caries and necrosis; more especially those that are spongy in their texture, as the short bones of the foot, and the articular ends of the long bones. The joints are liable to that large class of affections that are commonly known as *white swellings*, and which consist of thickening, disorganization, ulceration, and suppuration of the synovial membranes and cartilages.

Lastly, some of the *glandular organs* are peculiarly prone to scrofulous disease. Enlargement of the lymphatic glands, more particularly those at the side of the neck and the glands of the jaw, is of such frequent occurrence, and is usually so early a sign, that the physician, in determining whether an individual is scrofulous or not, commonly passes his hand over the glands in these situations,

in order to ascertain their condition and size. These glandular enlargements are especially apt to terminate in unhealthy and chronic suppuration. The testes and the mammæ are occasionally affected; and other glandular structures, though sometimes implicated, are by no means so commonly found diseased, as those just mentioned.

The occurrence of *tubercle* must be looked upon as the distinctive characteristic of scrofula; and when it occurs, it may be considered a sure sign of this affection, which has then reached its ultimate development. In those cases in which the scrofulous diathesis exists without having given rise to this product, it must be considered as not having been called into full and active operation, having merely manifested itself in the minor forms of the disease, such as ulceration of the skin and mucous surfaces.

Tubercle, though sufficiently well marked by its appearances and progress, cannot be looked upon as a specific affection, but must be considered as a perverted or unhealthy development of the nutritive materials, destined for the repair of the body and the restoration of the blood. According to Mr. Simon, it consists of the lymph or nascent blood. It is a "dead concretion," a "fibriniform product, insusceptible of development." "The scrofulous diathesis," says Mr. Simon, "consists in a peculiarity of blood development, under which the nascent blood tends to molecular death by superoxydation." According to Dr. Williams, tubercle is a degraded condition of the nutritive material, from which the old textures are renewed and the new ones formed, differing from fibrin or coagulable lymph, not in kind, but in degree of vitality and capacity of organization."

Anatomical tubercle essentially occurs in two forms, as semi-transparent grey granulations, smooth and cartilaginous in look, somewhat hard, closely adherent, and accumulated in groups, often with a good deal of inflammatory action in the surrounding tissues. These grey granulations, usually about the size of a small pin's head, appear to consist of a modified exudation of matter. They have a tendency to run into masses, and to form the true yellow tubercle, which is met with in opaque, firm, but friable concretions, of a dull whitish or yellowish color, homogeneous in structure, and without any appearance of vascularity.

The microscopic characters of tubercle present no very specific

appearances. We find that this product presents, under the lens, a homogeneous struma, which chiefly occurs in the grey granulations, a granular matter which is principally met with in yellow tubercles, drops of molecula, oil, and, lastly, considerable quantities of imperfectly developed exudation cells, more or less disintegrated, stationary or degraded.

The tendency of tubercle is most commonly to disintegration and liquefaction, at the same time that it gives rise, by its irritation, to inflammation and suppuration in the surrounding tissues; hence, it commonly leads to abscesses, the pus of which is always curdy and shreddy. In some cases, tubercle may become indurated, and undergo a species of calcification.

Causes.—The causes of scrofula, unless it be of an hereditary character, though very various in their nature, are usually such conditions as influence injuriously, the nutrition of the body. The hereditary nature of scrofula is well known, both to the public and to the profession; for although the disease is not commonly connate, yet the tendency to it is, and the characteristic nature of the affection often manifests itself at an early period, notwithstanding every effort to prevent its development. That a parent may develop a tendency to malnutrition, to misdevelopment of the blood, just as he may a peculiar feature or mental condition, is undoubted. It is by the hereditary transmission of peculiar combinations and modifications of action in the organization, that hereditary diseases develop themselves at certain periods in the life of the offspring, when the injurious results of the morbid actions that have been transmitted, have had time to be produced. There are certain conditions which, though not scrofulous, are supposed to have a tendency to develop this disease in the offspring to which they are transmitted; thus dyspeptic parents are said, and, I believe, with reason, to have strumous children; so, also, the offsping of very old or very young people, often exhibit a proneness to scrofulous affections. The influence of intermarriage is still a matter of doubt, though, I believe, it exerts but little influence in this respect; and it is commonly stated that the inhabitants of little communities, who intermarry closely, such as those in the isles of Portland and Man, are not more liable to scrofula than other individuals. The most potent cause of scrofula, and that which, in civilized countries, is

likewise most frequent, is mal-nutrition, arising either from want of food, or the use of inferior food by the poorer classes; or from over-feeding, and over-stimulation of the digestive organs in the children of the wealthier orders of society, thus inducing chronic irritation of the mucous membrane of the stomach, interference with the digestive powers, and, consequently, with nutrition. The influence of food that is insufficient in quantity, or innutritious in quality, has been shown by Mr. Phillips, in his excellent treatise on scrofula, to be the more immediate cause of this disease; and when conjoined with the injurious atmosphere of large towns, of close and over-crowded rooms, and want of light and exercise, may be considered as sufficient to occasion the disease in those cases in which no predisposition to it exists, and greatly to develop any tendency to it in the system. It is to the conjoined influence of agencies such as these, that we must attribute the prevalence of scrofula among the lower orders of town and rural populations. Masturbation, sexual excesses, licentiousness, drunkenness, the use of tobacco, syphilis, or any abuse of the system, may also be mentioned among the exciting causes of scrofula.

Scrofula is often called into immediate action by the debility induced by previous diseases, such as measles, scarlatina, hooping-cough, &c. It usually develops itself at an early age, though seldom before the child has reached its second year. It is most commonly about the period of second dentition that the disease declares itself, and it is rare to meet with it, for the first time, after the ages of twenty-five or thirty-five.

According to Phillips, when it is fatal, it generally proves so before the fifteenth year; sixty to seventy per cent. of the deaths occurring before this age. Sex does not appear materially to influence this disease, though, according to the same authority, the deaths of males, from scrofula, exceed those of females, in Europe, by twenty per cent. If, however, we are to regard phthisis as an allied affection, people who are scrofulous in early life, often having phthisis developed at a later period, these numbers may require correction.

Effects.—In the early stage, the glands are simply indurated, and a little firmer than in health; or else, if more advanced, they are of a grayish color, with a granular structure and increased

firmness. If it still advances, the proper tissue of the gland becomes absorbed, and tuberculous matter is either irregularly infiltrated or deposited in the form of distinct granulations. In the advanced stage, abscesses are observed, containing more or less pus.

Treatment.—The treatment of scrofula may be divided into preventive and curative. The preventive treatment consists in so regulating the diet as to supply all deficiences in the histogenic material of the different tissues. The digestive and assimilating organs should receive special attention, every possible effort being made to increase their tone. The surface should be bathed three or four times a week, in warm or cold water, as best agrees with the constitution. A liberal amount of exercise in the open air should be taken, and the patient avoid all excesses, both physical and mental. When these means fail to arrest the tendency to scrofula, a moderate amount of stimulants, in combination with small quantities of iron, may be taken before each meal. When the disease has become fully developed, whether in the skin, lungs, bones, liver, stomach, uterus, kidneys, or any other part of the system, the constitutional treatment should consist in a thorough tonic and alterative course. In case the disease appears in the form of herpes or pustulæ, the treatment has been fully described under that head. Or, if in the form of phthisis, the treatment has already been given. When scrofula manifests itself in the form of ulcers, of an indolent or irritable character, the constitutional treatment should consist of the following remedies:—Take scrophularin, twenty grains: carbonate of iron, two drams; chloride of sodium, one dram; white sugar, three ounces. Mix, triturate, and take one teaspoonful three times a day, in a little Port wine. The diet should consist of rich animal broths, ripe fruit, &c.; and a wineglass full of malt liquor drank with each meal. If there are ulcers, they should be stimulated by the occasional application of a mild solution of sulphate of zinc, or vegetable caustic. The limb should be bandaged with moderate tightness, and the ulcer covered with a soft slippery elm poultice. After the above treatment has been pursued for about two weeks, it should be changed to the following:—Take compound syrup of stillingia, half a pint; syrup of apocynum, half a pint; syrup of iodide of potassium, two ounces. Mix, dose, from one teaspoonful to one tablespoonful three times a

day. This treatment should be pursued for two or three weeks, when it should be omitted, and the following substituted:—Take phosphate of lime, half an ounce; carbonate of iron, three drams; phytolaccin, fifteen grains; white sugar, one pound. Mix, triturate, and add to one pint of water and one pint of best gin. Dose, one tablespoonful three times a day. If the ulcer should still prove indolent, it may be touched with caustic of potassa, followed by a poultice of slippery elm, wet with tincture of arnica. When the disease appears in the form of caries or necrosis of the bone, the dead portion should be destroyed by the sulphate of zinc, or caustic potassa. The sore should be stimulated, as in ulcer of the soft parts, until it becomes healthy; after which, collodion, or a mild ointment, may be applied, until union takes place. In no case, however, in disease of the bones, should the ulcer be allowed to heal until the necrosed portion of bone has been entirely exfoliated, and the ulcer healthy in every respect.

When scrofula attacks the glands of the axilla, groin, or breast, causing enlargement and irritability of these parts, absorption should be promoted, if practicable, by the use of iodine ointment and moderate pressure; if this fail, suppuration may be induced by the application of a poultice of equal parts of gum-myrrh, capsicum and slippery elm. Internally, phytolaccin, iodide of potassium, apocynin, chimaphillin, ampelopsin, in connection with the compound alterative syrup, are the remedies to be used.

When the disease manifests a strong tuberculous tendency, cod liver oil, strychnin and iron are remedies of great value. A favorite prescription of mine, is the following:—Take cod liver oil, two ounces; tincture of strychnin, one dram; carbonate of iron, two drams; simple syrup, four ounces. Dose, a teaspoonful three or four times a day. The syrup of ceanothus Americanus, three or four times a day, has also been successively used. When the digestive organs are weak, two or three grains of alnuin, taken half an hour previously to each meal, may also prove serviceable. Recently, Mecca oil, in thirty or forty drop doses, repeated every two or three hours, has been beneficially used.

TABES MESENTERICA.

Tabes mesenterica is a tubercular or strumous degeneration of the mesenteric glands, followed by emaciation and general derangement of the functions of nutrition. It occurs particularly in children of a scrofulous diathesis, and in those who are weaned too soon, or fed on indigestible substances; but it is not confined to any period of life, as it has been observed in a six or seven month fœtus, and in old age; the majority of cases, however, occur between the ages of one and twelve years. It is occasionally associated with tuberculous peritonitis, scrofulous affection of the spine, rickets, chronic hydrocephalus, etc.

Symptoms.—The symptoms of tabes mesenterica are very doubtful, the greater number belonging to the affections with which it is associated. The following are those usually enumerated as indicative of the affection:—The appetite is impaired, there is abdominal pain, more or less constant, causing the patient to keep his thighs flexed upon the bowels. The abdomen is swollen and tense. Occasionally there is vomiting of glairy matter. The bowels are irregular, and generally loose, the stools consisting of thin, curdy matter, being very offensive and copious. The features are shrunken, the surface pale, the breath offensive, the urine scanty, the pulse accelerated, the lips are of a dark red hue, and the angles of the mouth are covered with small ulcers, or the whole is fissured. Cough is a frequent symptom. The patient is dull, and indisposed to bodily or mental exertion. There are great pallor and general emaciation, the debility increasing rapidly. Finally, hectic fever sets in, the emaciation is extreme, effusion takes place in the extremities, sometimes in the abdomen, and death closes the scene. Recovery may, however, take place, if the disease be treated before the functions of the glands are much impaired. The convalescence is always very slow, and much care must be taken to prevent any relapse.

The mesenteric glands occasionally become tuberculous, and may advance to maturity without materially deranging the health; the existence of the disease being revealed first upon dissection, death resulting from some other affection. The progress of tabes mesenterica is usually very slow, continuing for years. It frequently

terminates favorably, if not complicated with other incurable diseases. In cases ending fatally, death results more frequently from the complicated affection than the disease of the mesentery.

Causes.—There is no doubt that a peculiar state of the system often exists, inherited from the parent, which constitutes a predisposition to the disease. The strumous diathesis may also result from various causes calculated to impair the vigor of the system, and impoverish the blood. The disease is generally hastened by exciting causes, as a meagre and unwholesome diet, impure air, sedentary habits, exposure to cold, excessive and injurious abuses of the system, mental anxiety, etc. The disease is often owing to inflammation or irritation of the lining membrane of the intestines, causing enlargement of the mesenteric glands. The exanthemata and repelled cutaneous diseases may be mentioned among its exciting causes. The disease is most frequent among the poor, and is very apt to prevail in large hospitals crowded with children.

Diagnosis.—The diagnosis of tabes mesenterica is sometimes very difficult, as it may be confounded with various other diseases. Hydrocephalus, in its early stages, somewhat resembles this disease. But in the former the cerebral oppression is greater, the mind is duller, sickness is more troublesome and constant, there is strabismus, and the abdomen is flattened. The general character of the symptoms in tubercles of the bronchial glands is the same as in strumous disease of the abdomen, although there is greater disturbance at an earlier period than when the mesenteric glands are alone affected. Tubercular peritonitis can scarcely be distinguished from tabes mesenterica, with which it is often associated. The diagnosis between them is, however, unimportant.

Anatomical Characters.—In the early stages the glands are usually found red, swollen, and indurated, but they may exhibit no inflammatory signs, and even be paler than in health. The tuberculous matter exists in roundish granules, deposited either in the substance of the gland, or beneath its peritoneal covering. The substance of the gland is either absorbed, or forced within smaller limits, sometimes entirely disappearing, the glands being transformed into masses of tuberculous matter. These are either isolated or connected, varying in size from that of a pea to a hen's egg. Occasionally this matter is deposited between the laminæ of the

mesentery. It is of a dull white or yellowish color, and undergoes the various stages of softening, being finally converted into a seropurulent liquid, intermingled with curdy flakes. Occasionally calcareous or earthy matter is contained within the glands, and in some instances it has been observed surrounded by a bony shell. The peritoneum may be found inflamed or tuberculated. The mucous membrane of the bowels may be reddened or ulcerated. Occasionally the omenta and liver are inflamed.

Treatment.—The treatment of tabes mesenterica consists in regulating the diet of the patient, and strengthening the system generally. In children, not unfrequently the disease is produced by imperfect nutrition. This may result from a perverted secretion of the mammæ. Very frequently it will be found that the mother's milk is entirely inadequate to nourish and support the tissues of the child. Upon making a microscopic examination of the secretions of the breast in a large number of cases of tabes mesenterica, I have observed that the milk corpuscles were very deficient, and that the milk consisted mostly of a thin, serous fluid. This impoverished condition of the breast milk is frequently produced by the mother indulging in excessive sexual intercourse, or it may arise from a scrofulous or tuberculous constitution. It is also a result of mental anxiety, over-exertion, and improper diet; or it may be produced by novel reading, attending parties, or other excesses. Whatever may be the cause of this morbid condition of the secretion of the mammæ, if it cannot be corrected, the child should be nourished with cow's or goat's milk, and such other articles of food as are adapted to the delicate condition of the stomach in these diseases. The abdomen should be bathed two or three times a day with the compound tincture of capsicum and myrrh, and the following mixture given:—Take chloride of soda, one dram; phosphate of lime, two drams; hypophosphite of iron, half a dram; cod liver oil, one ounce; simple syrup, three ounces. Mix, and give from one-half teaspoonful to a teaspoonful five or six times a day, in a little plain grape wine. If there be great debility of the digestive organs, from one-fourth to one half grain of capsicum, and one grain of muriate of hydrastia, may be given three or four times a day, in a teaspoonful of cream. The diarrhœa may be controlled by giving small doses of the compound syrup of rhei et potassa.

SECTION IX.

DISEASES OF THE RESPIRATORY AND CIRCULATORY SYSTEMS.

CORYZA.

Although this disease is usually a mere symptom of measles, hooping-cough, and other affections, depending upon a specific malaria, yet it sometimes occurs as an iodopathic affection, and prevails in an epidemic form. Coryza, or inflammation of the nostrils, consists of an inflammation of the Schneiderian membrane, and the sinuses communicating with it, attended with an increased discharge. The first sensations experienced in the inflammatory course, are those of dryness, fulness, and irritation of the nostrils, with sneezing, followed by a copious discharge of a thin, colorless, acrid fluid. There is a dull pain, with burning heat in the nasal passages, and occasionally severe stinging sensations from the irritation of the acrid fluid. The eyes are red and watery, and there is pain in the forehead, owing to the extension of the inflammation to the frontal sinuses. The maxillary sinuses may become involved in the inflammatory course. Obtuseness of hearing is frequent, resulting from swelling and closure of the Eustachian tubes. The nose and cheeks are red and swollen. There may or may not be any constitutional disturbance. Frequently, however, when the inflammation is extensive, there is considerable derangement of the constitution. There are rigors, or chills alternated with flushes of heat, pains in the limbs, a furred tongue, anorexia, severe headache, a hot skin, and an excited pulse. The duration of the disease is about seven days, the symptoms com-

mencing to subside on the fifth. It may, however, through improper management, become chronic, and be prolonged for weeks, months, or years. When there are fresh attacks of cold experienced before the old have ceased, the inflammation retains an acute character, with a thin, acrid discharge for some time. This watery secretion, which has given it the name of coryza, is not always present, the inflammation being dry sometimes at the commencement, and remaining so until thick mucus, or muco-purulent secretion takes place. The inflammation frequently extends to the pharynx, larynx, and bronchial tubes, constituting catarrh, but generally it is confined to the nostrils and adjoining parts. Heaviness and pain in the middle of the forehead, extending frequently to the superciliary ridges and the eyes, are experienced when the frontal sinuses are affected, (*gravedo.*) Coryza is sometimes regularly intermittent. In very young infants, it is attended with great difficulty in suckling. They sometimes become black in the face from suspended respiration, and convulsions may even ensue from the same cause. There is also a tendency to exudation of coagulable lymph from the membrane, forming solid layers upon the surface, as in diphtheritis. When this is the case, the disease is of a serious character, occasionally proving fatal, from the extension of the inflammation to the larynx and lungs. It may be distinguished by the offensive odor of the secretion, the occasional expulsion in coughing, and sneezing of portions of the false membrane, and the appearance of the exudation in the fauces, or near the anterior nasal orifices.

Causes.—The most frequent cause of coryza is the partial application of cold, as to the back of the head or neck, to the feet, etc., and the effect is especially apt to be produced after perspiration from heat or exertion. It may result from the direct application of acrid vapors or irritating powders to the nostrils. Some individuals are more liable to disease than others; and in others it occurs periodically at a certain date, yearly, without any reference to the state of the weather. It sometimes prevails in an epidemic form, being generally an attendant upon influenza. It is one of the early symptoms of measles, scarlatina, variola, etc.

Treatment.—In the commencement of the disease, but little more is necessary than a hot bath, a large draught of ginger tea upon re-

tiring, and the inhalation through the nostrils of some hot aromatic vapors, such as balm, polygonum punctatum, etc. When the disease is produced by zymotic gases, and infectious miasms, as measles, scarlatina, etc., it is readily cured by inhaling the fumes of diluted sulphuric acid. This acts as a disinfectant, and destroys the algæ vegetation, upon which the diseases depend. In the pseudo-membranous variety, the vapor of muriate of ammonia, inhaled through the nostrils, and the injection of hot water, will generally remove the difficulty. When it does not, a mild lobelia emetic may be administered, followed by the acetic tincture of sanguinaria. In children the use of oleum anserina, as a topical application, and a teaspoonful administered three times a day, is a most valuable remedy. Cod liver oil may be used in the same way.

If it extends to the larynx and pharynx, stillingin is the remedy. When of a periodical character, quinine and iron should be given. A hot foot bath, and almost any course of treatment that establishes a free perspiration, will usually control the inflammatory action of the Schneiderian membrane.

OZÆNA.

Ozæna, or chronic inflammation of the nostrils, is attended with a feeling of uneasiness, heat, and stiffness of the nose, swelling of the Schneiderian membrane, and an offensive muco-purulent secretion. The nostrils are sometimes closed, owing to the thickening of the membrane, thus impeding the passage of the air. The discharge is occasionally quite purulent, and of a yellowish or greenish color, or sanious, and tinged with blood. The breath, in some instances, is extremely offensive. This affection is occasionally associated with ulceration, and caries of the bone, or necrosis. When the latter is the case, pieces of bone sometimes escape with the pus or sanies, or the secretion may dry, become hard, forming large solid masses or plugs, which entirely obstruct the nasal passage, and after a time are forced away by the patient. These will reaccumulate every few days. The sense of smell is occasionally lost.

The disease usually continues for weeks and months, and even for many years, or during the entire life of the patient.

Causes.—In many instances, ozæna results from a continuation or a frequent repetition of the acute inflammation, or of common

catarrh. In some instances, it is associated with a strumous or gouty diathesis, with a tendency to scaly cutaneous eruptions, associated with disordered digestive conditions. When it does not exist in an ulcerous form, it depends upon some impediment to the free discharge of mucus from the nostrils or sinuses, which, constantly accumulating, becomes putrid, and excites inflammation. When associated with ulcers, it is generally the result of a scrofulous, scorbutic, or syphilitic taint. In some cases it depends on the presence of foreign bodies in the nostrils.

Diagnosis.—In all cases of chronic inflammation of the nostrils, they should be examined with a probe and a nasal speculum, so that it can be ascertained whether there is any impediment to the free discharge of the sanies. Rhinolithes may form in the nasal cavities, composed of the phosphate and carbonate of lime, magnesia, and mucus. Abscess of the septum may also give rise to ozæna. When there is a polypus, it should be removed as soon as possible, as its growth pressing upon the neighboring parts, will cause disfiguration of the nose and face. When the cause of the disease is very obscure, the recesses of the nostrils should be examined by the rhinoscope.

Treatment.—The constitutional symptoms should receive special attention; and when there is a scrofulous or syphilitic taint, the general treatment for these difficulties should be instituted. The stomach and bowels should also receive special attention, the digestion being invigorated by means of alnuin, strychnin, and viburnin, or from one-half dram to one dram of the anti-dyspeptic mixture, may be administered three or four times a day. The cure of ozæna alsodepend s much upon the condition of the skin; hence, this emunctory should be stimulated by a salt water bath every morning, and a hot soda bath every evening. The topical applications for ozæna are most numerous. Those which have been found the most beneficial are the vapors of iodine, bromine, chloride of sodium, muriate of ammonia, tar, naphthæ, creasote, and astringent and narcotic herbs. I have usually found relief to follow the inhalation of the fumes of muriate of ammonia through the nostrils. This can be accomplished by placing a little of the salt in an iron spoon, holding it over a lamp or gas, until the fumes escape freely, and let the patient inhale it. Tar, chloride of sodium, and other salts, may

be inhaled in the same way. The vapor of various vegetable preparations, such as nymphæ odorata, hydrastis canadensis, geranium maculatum, humulus lupulus, etc., may be inhaled, by means of the ordinary inhaler, or the medicines may be atomized by the atomizer, and introduced in this way two or three times a day. In several obstinate cases of ozæna, I have been successful in the treatment, by allowing the patient to inhale with the atomizer, Mecca oil three or four times a day, in connection with a thorough constitutional treatment. Nitrate of silver, muriate of hydrastia, and iodide of ammonia, have also been introduced in the same way with great success. When there is caries of the bones, injecting the nostrils by means of a small nasal syringe, with a weak solution of sulphate of zinc, may prove serviceable. In most chronic cases, I have also found benefit derived from an occasional round of quinine and iron. In one case, where all other methods of treatment had failed, I produced a radical cure by introducing a solution of the mixture of the chloride of iron, of the proportion of one dram to six ounces of water, by means of a small probang. Vapor of hot water inhaled frequently, may also afford relief. Much care should be observed to prevent the escape of this secretion through the lateral nasal passage, as under such circumstances it is liable to produce inflammation of the larynx, pharynx, and bronchi, and thus hasten the development of tuberculous deposits.

CATARRH.

Catarrh consists of an acute inflammation of the mucous membrane of some portion of the air-passages. When the Schneiderian membrane of the nose is affected, the catarrh is styled *coryza;* if the frontal sinuses be the seat of disorder, *gravedo;* and if the trachea and bronchi be involved, it is designated as *bronchitis.*

Catarrh is a common disease, and arises from repeated colds, damp apartments, wet feet, insufficient clothing, hot rooms, a sudden check of perspiration, snuffing tobacco, and various other imprudences. A rheumatic or scrofulous condition of the system predisposes to an attack.

Symptoms.—The symptoms of catarrh are weariness, pains in the back and limbs, oppression across the forehead, an increased dis-

charge from the nose, profuse lachrymation, hoarseness, sore throat, coated tongue, impaired vision, fever, anorexia, constant hawking, cough, and if the disease continue, partial deafness, dizziness, and various other symptoms may occur. An eruption of herpes appears upon the lips, most frequently, however, about the angles or middle of the lower lip. In about two or three days these symptoms subside, or the disease assumes a more severe form, and may produce ophthalmia, gastritis, tonsillitis, laryngitis, tracheitis, pharyngitis, or bronchitis.

In persons susceptible to the disease, attacks may recur from very slight causes. The affection may assume a chronic form.

Treatment.—Under ordinary circumstances but very little treatment is required. In cases where the catarrhal symptoms are severe, a hot bath, and a large draught of warm ginger tea upon retiring, will usually relieve them. When there is extensive inflammation or congestion of the Schneiderian membrane, the inhalation of the hot vapors of humulus lupulus and polygonum punctatum, in addition to the bath, may be serviceable. When there is febrile excitement, a little veratrum or aconite may be given, and if the bowels be constipated, a dram of the fluid extract of leptandria virginica and prunus virginiana should be taken sufficiently often to remove the difficulty. Any ordinary catarrh or cold can be at once arrested by taking a hot bath or spirit sweat, and the entire absence of food or drink for twenty-four hours.

INFLUENZA.

Influenza is an epidemic affection attended with great depression, chilliness, headache, cough, and a discharge from the eyes and nose.

As an epidemic, it is remarkable for its rapid and extensive diffusion, affecting simultaneously a vast number of persons of all ages. Its first visitation in this country occurred in the year 1510. Some epidemics of influenza are very severe. One in 1782, which extended over the whole of Europe, was exceedingly fatal. During the epidemic of 1850, nine thousand persons were said to have died of the disease in Rome.

The occurrence of epidemic catarrh is connected with some particular state or contamination of the atmosphere, which influence has been a subject of much conjecture and discussion, but which

has not yet been satisfactorily explained. Prof. Mitchell has attributed it to cryptogamous productions in the atmosphere; Holland, to animalculæ; and Schœnbein, to ozone. These views, however, are merely speculative, as demonstrations have proved that the cause is independent of any noticeable atmospheric changes.

Symptoms.—Influenza usually appears with the ordinary symptoms of catarrh, only in an aggravated form. In many cases it is very slight, unattended with any fever, and scarcely noticed by the patient. An attack usually commences with coryza or sore throat, lassitude, pain in the limbs, aching in the back, chills alternated with flushes of heat, dryness of the skin, headache, sneezing, cough, perverted taste, and a disordered condition of the stomach. There are giddiness, depression of spirits, general uneasiness and restlessness, and much muscular prostration. The headache may be quite severe, affecting equally the whole organ, but more frequently confined to the forehead. Occasionally the pain extends to the back of the neck, in the form of rheumatism, but the most characteristic feature of influenza is the debility which attends it. This symptom is ushered in at the very commencement of the attack. As in catarrh fever, there is generally a remission of the febrile phenomena, and an exacerbation towards night. The degree of intensity in the nasal, throat, and pectoral symptoms, are extremely variable.

The effects of the epidemic influence are not necessarily those of catarrh. In some instances, its force has been spent upon the brain, causing violent cephalalgia, flushed face, delirium and fever; again, the digestive organs have been affected, as evinced by epigastric pain and tenderness, nausea, and vomiting. Inflammations of the lungs, pleura, and pericardium, are frequent during the occurrence of influenza. Dr. Rush has observed abscesses of the frontal sinuses among the forms of this affection. Hæmoptysis occasionally occurs in persons predisposed to it.

Influenza, or epidemic catarrh, usually attains its height after two or three days, and the patient is generally convalescent in about a week, but a cough usually remains after the other symptoms have subsided. The fever declines in most cases about the fifth day with profuse sweating, diuresis, or expectoration.

Influenza is rarely fatal, unless complicated with inflammation of

the brain, lungs, or heart, or occurring in persons debilitated by old age, or some previous disease. In infants it occasionally terminates fatally.

Diagnosis.—Epidemic catarrh differs from a common cold in its greater severity, and the degree of prostration manifested.

Treatment.—Whatever may be the nature of this peculiar epidemic influence, one fact has been demonstrated, that is, that the vapor of sulphurous acid, when brought in contact with this miasm, will completely neutralize it. This vapor may be generated by the burning of a small piece of sulphur, either in a retort or on a shovel, and influenza may be immediately cured by allowing the patient to inhale it. Another method of curing this affection, is to drop ten or fifteen drops of sulphurous acid into a wine-glassful of water, gargle the throat, and syringe the nostrils with it. When the poison has become absorbed, and the glands and system generally contaminated, from five to ten grains of sulphate of quinine should be added to four ounces of water and a dram of tinctura ferri chloridi, and the patient take a teaspoonful every half hour or hour until all is taken. In very severe cases, it may be necessary to administer a lobelia emetic, followed by a spirit sweat and mild purge. When the throat is affected, it should be gargled with a solution of the chlorate of potash, and one or two drops of belladonna, administered two or three times a day.

ACUTE LARYNGITIS.

Laryngitis consists of an inflammation of the parts composing the larynx, especially of the mucous membrane, which covers the laryngeal cartilages, including the epiglottis. The inflammation may be, and is sometimes solely limited to the larynx, though it frequently extends to the posterior fauces, the velum palati, and the tonsils. The larynx, the seat of the voice, is situated at the superior and anterior part of the neck, at the top of the trachea, with which it communicates, and is liable to become inflamed, particularly its mucous membrane and sub-mucous tissue. It is composed of the thyroid, cricoid, and two arytenoid cartilages, is moved by a number of muscles, which are subject to spasms and paralysis, and is lined by a mucous membrane, weich, being reflected, constitutes the superior ligaments of the glottis. A sub-mucous tissue is situated

beneath the mucous membrane, and the larynx is also supplied with nerves and arteries. In respiration it gives passage to the air, and it is in the glottis, a narrow oblong aperture in the larynx, that the voice is produced by the chordæ vocales. These are found to separate widely in inspiration, and return in expiration, thus forming the respiratory movements of the glottis. The epiglottis is the fibro-cartilaginous covering of the glottis, attached anteriorly to the thyroid cartilage, and covered on both surfaces by the mucous membrane of the larynx and pharynx. This in a healthy state covers the glottis at the moment of deglutition, and prevents the passage of alimentary substances into the air tube.

Formerly its existence and agency were deemed absolutely essential, during the act of swallowing, to protect the entrance of food and fluids into the laryngeal cavity. Experiments, however, have confuted this original theory, inasmuch as its removal has occasioned no marked inconvenience among inferior animals. A case in Bellevue Hospital, New York, has, moreover, been reported, in which, owing to a syphilitic ulceration, this appendage was entirely destroyed. The difficulty experienced in deglutition ceased as soon as the ulceration healed. A controlling power over the voice was materially diminished, and a change in tone clearly discerned, but the ability to swallow with comparative ease was in this instance fully established.

Pathology.—The pathology of laryngitis is extremely simple. The mucous membrane of the larynx may become turbid and swollen, and the liquor sanguinis be effused into the subjacent areolar tissue. The chink called the *rima glottidis*, is narrowed by the tumid thickening of the lining membrane; its breadth is diminished whenever the membrane is protruded by infiltration of the tissue beneath it. It is so nearly closed, that sufficient air cannot pass inwardly to sustain the vital functions; a small portion only of the blood returned to the lungs from the right side of the heart is changed into arterial. The miserable patient is drowsy, and dies by a slow process of strangulation. Previously to death, he may become slightly delirious, but generally the mental faculties are retained and unaffected. If the glottis be entirely closed, his sufferings and life will quickly terminate. The inflammation in laryngitis is sometimes quite limited, the danger depending entirely upon its situation.

It may be remarked here, that in all diseases affecting the respiratory apparatus, the small size of the *rima* glottidis materially enhances the danger of the patient. It is a triangular space, only about an inch long, and a quarter of an inch wide in the male adult, and even less in the female.

Causes.—Exposure to cold and dampness when the body is heated, is the most frequent cause of laryngitis. It may, however, be produced by an excessive use of the voice, direct injuries, extension of inflammation from surrounding parts, the metastasis of erysipelas, the abuse of mercury, or it may arise from a scrofulous or syphilitic taint.

Symptoms.—The symptoms of acute laryngitis are at first obscure, as the disease may approach very insidiously. In its mild form, it is neither an uncommon nor a dangerous disease. In its severe form, it is more uncommon and dangerous. In either case, the inflammation attacks the mucous membrane lining the cartilages. If it be slight, it occasions simply hoarseness, a feeling of irritation in or near the larynx; a trifling cough, and some difficulty in swallowing. If the inflammation be violent, and particularly if the submucous tissues are involved, the symptoms are much more serious, and the sufferer's life is in imminent danger. The suffering is intense, as the swollen membrane nearly closes the rima glottidis. The respiration is seriously obstructed, the inspirations are long, and attended with a peculiar wheezing sound. There is a harsh, painful cough, difficult deglutition, excessive anxiety, hoarseness, or even aphonia. A moderate secretion takes place in and about the larynx, a part of which is expectorated with more or less saliva, constituting a ropy, glairy fluid. The pulse is generally frequent, contracted, and tense. In some cases, however, it is nearly natural, at least during the early stages. The face is generally pale, the eyes swollen, the countenance haggard and distressed, the tongue white with numerous red points, and covered with a layer of nearly transparent mucus. When the disease is fully developed, deglutition is very painful, producing frequently paroxysms of threatened suffocation. The respiration becomes less frequent than in health, oppressed and difficult. If the disease be unchecked, the patient starts up suddenly in bed, declares or makes signs that he wants air, the lips assume a livid or purplish color, the surface becomes

cold, the pulse frequent and feeble, the countenance ghastly and indicating intense anguish, the skin covered with a clammy perspiration, and finally death sets in with all the signs of deficient æration of blood, resulting in strangulation.

The disease at times is rapid in its course. If in a few days after its commencement, there be no improvement, life does not continue long. In such cases, there are probably great congestion and œdema of the laryngeal mucous membrane, and of the submucous areolar tissue, and spasmodic contraction of the larynx, or its muscles and vocal cords. When there is great inflammation of the epiglottis, it is frequently observed red, erect, thickened, and much swollen. The inflammation may, in rheumatic patients, extend to the pericardium, in which case there is, in addition to the ordinary symptoms of laryngitis, a severe, dull, heavy pain in the heart.

Laryngitis may terminate in suppuration, small abscesses accumulate about the larynx, or a pseudo-membrane may form on the tonsils, epiglottis, and even extend into the laryngeal cavity, in some rare cases of this disease, or it may assume a chronic character.

Diagnosis.—The diagnosis of acute laryngitis is sometimes a point of much importance. It is very essential that the complaint be not confounded with *diseases* of the *chest*, which are frequently attended with dyspnœa, and similar constitutional symptoms. But in the latter, either the case is chronic, or accompanied with such obvious symptoms of pectoral disorder, that there can scarcely be room for mistake, if due examination be made. Besides, in laryngeal affections, the change of the voice, the feeling as though a foreign body were in the throat, the dry, husky cough, (yet no physical signs denoting pulmonary disease,) the seat of pain, tenderness and constriction, the vast difference between the facility of inspiration and expiration, point beyond all doubt to the true seat of the disease. *Aneurism* of the *aorta*, by pressing on the windpipe, has given rise to symptoms which have been mistaken for those of laryngitis, but auscultation would render such an error impossible. To one of the forms of *croup*, laryngitis bears a close resemblance, but in the former, spasmodic contraction of the muscles of the glottis; in the latter, swelling of the lining membrane, or the parts beneath it, is the diagnostic symptom. Laryngitis is distinguished from *cynanche tonsillaris*, by the extreme and peculiar dyspnœa which attends it.

There may be difficulty of breathing in the latter disease, from the enormous swelling of the tonsils, but then such swelling will mostly be visible. In laryngitis the marks of inflammation to be *seen* on inspection of the fauces are usually slight and trifling, and quite inadequate to explain the difficulty of swallowing.

Anatomical Characters.—The mucous membrane lining the larynx is gorged with blood, softened and thickened, while the subjacent cellular tissue is distended with bloody serum, or a sero-purulent fluid, especially in the upper part of the larynx and epiglottis. The thickening is so great about the glottis, that the chink is almost closed, so that when held up to the light only a few rays can penetrate through it. The surface of the laryngeal membrane is generally covered with mucus; and sometimes coagulable lymph is found in patches on its surface, or effused into the submucous areolar tissue. In the œdematous variety, there is little injection of the mucous membrane, but great swelling, in consequence of the effusion of serum beneath it.

Prognosis.—The prognosis of acute laryngitis, especially in the adult, is generally favorable. If, however, the disease make its attack in the form of open and decided inflammation, in a person of tolerably vigorous constitution, and not previously laboring under chronic affection of the larynx, it may generally be cured, if treated properly in the early stages, before the powers of the system have been impaired by the depressing influences of the decarbonized blood. After this deterioration has commenced, the chances of saving the patient's life are much diminished. The imminence of the danger, and the rapidity of the disease depend mainly on the existence or non-existence of submucous infiltration. Where this contingency does not occur, the suffering arises chiefly from spasm, and the symptoms are not so alarming if promptly and properly treated. Children are more likely to recover than adults; for though the size of the rima glottidis is smaller, yet they are not so liable to submucous infiltration.

Treatment.—The treatment for laryngeal inflammation consists in thoroughly cleansing the stomach by means of an emetic and purge, and the skin by a hot bath, the application of hot packs to the throat, and the use of the tincture of veratrum viride to control the circulation. If there be active inflammation and extensive

œdema of the mucous membrane of the larynx, hot water should be gargled frequently; and in case of active dyspnœa, a hot solution of sulphate of zinc may be applied by means of a probang, as recommended under the head of tonsillitis. When the disease is associated with a malarial or miasmatic influence, a round of quinine and iron should be given, and if of an erysipelatous character, nitric or nitro-muriatic acid, in two or three drop doses, largely diluted, may be administered every two or three hours. The inhalation of hot vapors, such as that of belladonna, stramonium, verbascum thapsus, lobelia inflata, and comptonia asplenifolia, may be used by first preparing a strong decoction, and allowing the patient to inhale it through an ordinary inhaler. In very severe cases, a solution of nitrate of silver, of the strength of five grains to an ounce of water, may be applied to the inflamed parts by means of a probang. If the exudation become organized, the treatment already prescribed for diphtheritis should be instituted. The hot packs should be frequently changed, and continued until the inflammatory action is entirely subdued. In cases in which this treatment fails, laryngotomy or tracheotomy should be resorted to.

CHRONIC LARYNGITIS.

Chronic laryngitis is more frequent than the acute, and is generally associated with induration or ulceration of the mucous membrane. The vocal chords are sometimes destroyed by the ulceration, and occasionally the destruction extends to the muscles, and even cartilages. This affection is connected, in a majority of instances, either with syphilis or pulmonary tuberculosis; it may, in fact, be deemed a presumptive evidence of a phthisical existence. It differs much in degree, being in its mildest and simplest form nothing more than a chronic hoarseness; while in its higher grades, and with certain complications, it is one of the most serious diseases to which the human system is liable. It is frequently impossible in the earlier stages to discriminate between cases of the most opposite tendencies, as the most fatal sometimes commence with the same symptoms as the trivial, so that the affection, even in its mildest form, always requires attention. So long as the mucous membrane, though inflamed, maintains its integrity, there is little inconvenience. It is only when ulceration takes place that the case presents an alarming aspect.

Causes.—Colds, excessive use of the voice in speaking or singing,

irritating substances inhaled, propagation of inflammation from the fauces above and the bronchia below, foreign bodies in the larynx, mechanical violence, the retrocession of cutaneous eruptions, polypous excrescences, warts, and other tumors in the larynx or its vicinity, a scrofulous condition of the system, a syphilitic taint, excessive sexual indulgence, masturbation, and excessive use of mercurials, may be mentioned among its causes.

Symptoms.—The disease, when not consequent upon an acute attack, usually commences with hoarseness, a little uneasiness in the throat, and a slight laryngeal cough. The cough is dry at first; but when it is of long standing, it is followed by a yellowish opaque expectoration. It is apt to be excited by speaking loudly, or by the inhalation of cold air or irritating substances. The breathing is very little, if at all embarrassed, excepting when the membrane is ulcerated. In that case there is dyspnœa, the respiration is noisy, and the voice completely lost. There is considerable pain on pressure, the sputum is muco-purulent, or else purulent and streaked with blood, and sometimes, if the cartilages are involved, fragments of them are expectorated, and by the touch we recognize the changed state of the tube. The cough undergoes analogous changes, being hoarse, croupy, stridulous, or altogether without sound above the breath. Debility, emaciation, night sweats, frequency of pulse, œdema of the extremities, loss of appetite, occasional nausea, vomiting and obstinate diarrhœa, mark the approaching close, and the patient dies in a state of hectic exhaustion. The symptoms of chronic laryngitis are purely local. It is only when there is considerable ulceration, or a progressive alteration of structure in the affected part, that the general health gives way. Yet it is frequently found to be connected with a broken constitution, because the inflammation of the larynx, both in its simple and ulcerated forms, is often combined, as I have previously intimated, with the tubercular diathesis, or with syphilis. Where neither of these exists, (rare cases,) the affection may be regarded as idiopathic.

Diagnosis.—Chronic laryngitis is liable to be mistaken for an aneurism of the aorta. The distinction is mainly made by attention to the physical signs. Cases of *nervous aphonia* are sometimes confounded with this disease, and it is not easy to avoid this error. The loss of voice may be either partial or complete. It often comes on without any previous warning, and this fact aids us greatly in

diagnosis, together with the absence of cough, expectoration, local pain, and of all trouble in breathing in aphonia.

Respecting *tumors* of the larynx, and polypoid growths in its interior, we know as yet very little, and not sufficient to distinguish them with any certainty, by their symptoms alone, from chronic laryngitis. Their most reliable signs, irrespective of those of chronic laryngeal inflammation, are a steadily increasing difficulty in breathing, and a tendency to attacks of suffocation. The detection at the seat of the larynx, of a growing tumor, accompanied by a severe cough, a sanious sputum, and emaciation, would, in addition to the symptoms enumerated, warrant the diagnosis of *cancer*, whether or not much pain were present. *Polypi* in the larynx may sometimes be seen by depressing and dragging forward the tongue until the epiglottis is brought within view. The laryngoscope will aid in the diagnosis.

Anatomical Characters.—If the patient die in the earlier stage, the mucous membrane is found red, thickened, softened or indurated, and often rough from the enlarged follicles. At a more advanced period, ulcers are found in various situations, most frequently between the vocal ligaments and epiglottis, sometimes superficial, again deep, penetrating through the mucous membrane to the cartilages, and occasionally through the latter. The cartilages are sometimes observed ossified or encased in bony matter, and again they are found partially in a state of caries, or of necrosis, with the dead portions surrounded by ulceration, and bathed in a fetid pus. The epiglottis and vocal ligaments are sometimes irregularly contracted, ulcerated, and partially or wholly destroyed. The submucous tissue is infiltrated with serum or pus, or thickened and indurated; and the ventricles are sometimes obliterated from this cause. The muscles of the larynx are wasted, hardened, and the ligaments distorted. Excrescences of various kinds appear on the surface of the mucous membrane, especially in syphilitic cases.

Prognosis.—When the disease is connected with pulmonary consumption, the prognosis is very unfavorable. The syphilitic variety may generally be cured in its earlier stages, and is seldom fatal. When neither of these complications exists, and no serious disturbance of the general health can be discovered, we may entertain a reasonable hope of the recovery of the patient.

Treatment.—When chronic laryngitis originates from colds, it

can usually be removed by a warm bath, hot packs to the throat, inhalation of hot vapor, and a few doses of aconite. When associated with a syphilitic contamination, constitutional treatment for that disease should be at once instituted, and the parts touched once or twice a week with a moderately strong solution of argenti nitras, by means of a probang. When associated with a phthisical habit, every possible effort should be made to invigorate the constitution, by the use of a nutritious diet, fresh air, sea bathing, and the liberal use of malt liquors. Cod liver oil, iron, hypophosphite of lime, and vegetable tonics should also be liberally administered. The patient should inhale the vapor of Mecca oil three or four times a day. Other vapors, such as carbonate of ammonia, iodide of potassium, iodine, bromine, and creasote, have been successfully used. These can be inhaled by means of the common atomizer. Nitrate of silver has also been extensively resorted to, but with less success than the remedies first enumerated. When the inflammation extends to the pharynx, a gargle of the hot decoction of hydrastis Canadensis may be resorted to with advantage. The irritating plaster applied to the throat, and caused to remain until free pustulation is produced, also proves very serviceable in many cases. When the disease has resulted in ulceration, in addition to the cod liver oil, iron, tonics, and other treatment, from fifteen to thirty drops of the Mecca oil should be administered every two or three hours, and one dram of the muriate of hydrastia, incorporated in one dram of glycerine, and applied to the ulcers by means of a probang, three or four times a day. To relieve the congestion and engorgement of the vocal organs and mucous membrane, from one-half to one grain of stillingin should be administered two or three times a day. When there is ulceration of the cartilage, one teaspoonful of equal parts of the syrup of ceanothus Americanus, and the compound syrup of frostwort should be administered once or twice a day, in connection with the other remedies. Expectorants, nauseants, and all other debilitating remedies, should be carefully avoided.

LARYNGEAL AND TRACHEAL PAINS.

Severe pains of a neuralgic character frequently attack the larynx and trachea, which extend along the anterior part of the throat, and beneath the upper portion of the breast-bone. It occurs in parox-

ysms, or may continue for a great length of time without any remission. Spasm of the muscular fibres sometimes accompanies the neuralgia.

Causes.—Its most frequent cause, is a rheumatic or gouty tendency in nervous constitutions. It may also arise from general debility, or irritation of the nerves or their centres, and from vegetable miasm. It prevails more generally in malarial districts, than in other localities.

Treatment.—When it depends upon a gouty or rheumatic constitution, acetate of potash, colchicum, and the tincture of macrotis racemosa, are the remedies. When it is produced by a malarial influence, quinine, iron, strychnin, and cypripedin, should be given, either separately, or in such combinations as the case may indicate. Almost instant relief may be produced by bathing the throat in equal parts of chloroform and tincture of aconite.

ACUTE BRONCHITIS.

Inflammation of the mucous membrane of the bronchia is of frequent occurrence. Its severity is in proportion to the size of the tubes involved. When the smaller ones are affected, *capillary* bronchitis, or suffocative catarrh, is established. The forms of bronchitis, dissimilar as they are clinically, scarcely differ in their anatomy. Whatever portion of the membrane is attacked by inflammation it becomes swollen, injected, relaxed, and may undergo all the various transformations peculiar to an inflamed mucous surface. Bronchitis may exist as an independent affection, or be associated with any of the varieties of pulmonary parenchymatous disorders.

Symptoms.—Bronchitis may exist either in an acute or chronic form. In the former variety, affecting the large and middle-sized tubes, coryza, sore throat, hoarseness, and slight rigors, are the first symptoms. There is more or less lassitude and pain in the limbs. As the disease progresses, there is a sensation of heat and soreness, or rawness of the bronchial surface, oppressed breathing, and a spasmodic cough and pain. The cough in the early stage, is followed by a clear, frothy expectoration, with a saline taste, which changes from an almost transparent fluid, to a yellowish or greenish sputum; when the cough becomes looser, and less fatiguing, this may be small or great in amount, and be streaked with blood.

In a more severe form of the disease, the small capillary tubes, as well as those of a medium and large size, are implicated. In this form the pulse is extremely frequent, there is great dyspnœa, a cyanotic appearance of the countenance, coldness of the surface, difficult respiration, and a tendency to asphyxia. The vital powers rapidly become exhausted, and unless relieved by timely treatment, delirium, with fatal coma or convulsions, terminates the patient's life.

Physical Signs.—In most cases, slight dulness on percussion will be detected. In the protracted cases, a greater amount of dulness may be perceived at the base of the lung, owing to the gravitation of the excreted fluid. On auscultating the chest, the respiratory murmur will be found weakened, and in some instances entirely suppressed. There are mucous, sibilant, and sonorous râles, in various combinations.

In the early stage of the disease, the sonorous and sibilant râles are most marked, and the mucous in the second, but both are frequently combined in the latter. In capillary bronchitis, in addition to the above signs, there is a sub-crepitant râle at both bases, posteriorly, with a fine mucous râle at the middle and apex. If the latter be predominant, it indicates inflammation of the smaller branches of the bronchi.

Causes.—The most frequent causes of bronchitis, are colds, dampness, a low electrical state of the atmosphere, heated air, acrid gases or vapors, and irritating-substances inhaled into the lungs; or it may arise as a complication of other diseases, such as asthma, hooping-cough, scarlet fever, etc.

Diagnosis.—Acute bronchitis may be distinguished from all other affections, by the tightness in the chest, with little or no pain, the sonorous and sibilant râles in the early stages, and the mucous and the subcrepitant râles in the latter, and by the headache, cold extremities, and moderate febrile reaction.

Anatomical Characters.—In some acute cases, in which the secretion has been copious, the lungs do not collapse on opening the thorax, all the minute tubes being filled with the exudation. The mucous membrane is more or less injected throughout its whole extent. It is also thickened, and frequently slightly softened and ulcerated.

Prognosis.—The prognosis is attended with uncertainty, for cases that appear to be doing well may suddenly terminate fatally from effusion into, and rapidly filling up of the small bronchial tubes and air-cells. A copious and free expectoration of a not too viscid secretion is generally a favorable indication, particularly if it assumes gradually a yellowish color, thus indicating a termination of the bronchial inflammation.

Treatment.—The treatment of bronchitis depends much upon the severity and cause of the disease. When of a mild form, a hot soda bath, hot packs, and a few doses of the veratrum viride, will usually control it. In the more severe forms, the treatment should be premised by a thorough emetic, a mild purge, and a hot bath or spirit sweat. Hot packs should be applied to the chest, and frequently renewed during the active form of the disease. The arterial excitement should be controlled by means of veratrin, or the tincture of veratrum viride. If there be a malarial influence associated with the disease, quinine and iron should be given in connection with the veratrin. When there is much dyspnœa, and extensive exudation into the bronchi, from one-half dram to one dram of the wine tincture of lobelia may be added to a tumbler of water, and a teaspoonful administered every half hour until the symptom is relieved. If there be much dulness on percussion, indicating extensive effusion into the bronchi, two or three grains of iodide of ammonia should be administered two or three times a day. Four or five grains of iodide of potassium, administered every two or three hours, has been successfully used for the same difficulty. Sanguinarin, and the sanguinaria Canadensis, appear to exert a specific influence over the bronchial mucous membrane; hence, when the disease is not readily controlled by the general treatment, from one-eighth to one-fourth of a grain should be given every half hour, or hour, until the inflammation is subdued. One-half dram of the acetic syrup of sanguinaria may be administered every hour or two for the same purpose. During the treatment the strength may be sustained by means of beef tea, small doses of capsicum, and cream, and as soon as convalescence is established, vegetable tonics and iron. Mucilage of gum Arabic, flaxseed and ulmus fulva, with lemon juice and white sugar, may be liberally used to allay the cough and satiate the

thirst. The inhalation of oleaginous vapors, such as Mecca oil, oleum anserinus, and cod liver oil, by means of the atomiser, has been employed in many forms of bronchitis. The hot vapors of bitter herbs, as well as carbonate of ammonia, creasote, and iodide of potassium, have been occasionally beneficially used. Our experience, however, is that the only inhalations that are of much benefit in acute bronchitis, are those of heated air, and vapor of hot water.

CHRONIC BRONCHITIS.

Chronic bronchitis like, other forms of chronic inflammation, frequently succeeds the acute, although it may occur in a slow and insidious manner, without being preceded by it. It attacks individuals of all ages, but is most frequently met with in the aged, and those who are much exposed to the inhalation of dust. Dilatation of the bronchi with condensation of the surrounding lung-tissue occasionally results from it, producing bronchorrhœa. Chronic bronchitis is seldom fatal in itself, but is often the indirect cause of death by leading to other diseases.

Symptoms.—When the disease succeeds acute bronchitis, the febrile symptoms disappear; but the pulse remains frequent, and the cough and difficulty of breathing prove persistent, although these symptoms are materially relieved by free expectoration. There are still nightly exacerbations, and irregular sleep. The expectoration is copious, opaque, and in some instances, puriform. Night sweats are frequent, occasioning great debility. If the disease should not be relieved, the cough will become croupy, the expectoration more copious, the dyspnœa increases, there is diarrhœa, and death soon follows

Bronchitis occurring in aged people deserves particular attention. It has been described as peripneumonia notha, catarrhus senilis or sub-acute bronchitis, consisting of a sub-acute attack of general or capillary inflammation of the tubes. The symptoms indicative of these cases are violent catarrh, great dyspnœa, and an excessive secretion of opaque frothy mucus loaded with pus-cells and columnar epithelium. In some instances the febrile and catarrhal phenomena are at first moderate, but after a few days they

become more violent, there is orthopnœa and asphyxia, a rapid pulse, hurried respiration and great prostration. Capillary bronchitis may terminate fatally by the accumulated mucus, which the patient is unable to expel, producing suffocation.

Plastic bronchitis, a rare form of bronchial disease, consists of the formation of concretions of exudation within the tubes; its chief symptom being the occasional ejection of casts of the tubes. When the concretions are of a larger size, the expectoration is preceded by a dry and persistent cough, dyspnœa, and not unfrequently hemoptysis. This disease may continue for years, the patient having acute attacks every few weeks.

There are several varieties of bronchitis, produced by the inhalation of different particles of matter which irritate the tubes. We have the knife-grinder's rot, carbonaceous phthisis occurring in miners, and cotton pneumonia, met with in operators in cotton mills.

Bronchitis may occur secondarily in blood-diseases; thus typhoid bronchitis occasionally is associated with typhoid fever, greatly increasing the danger of the affection. Gouty, rheumatic and scrofulous bronchitis may sometimes be observed. Individuals laboring under a syphilitic taint are apt to suffer from syphilitic bronchitis, giving rise to excessive muco-purulent expectoration, night sweats, great debility and emaciation.

Physical Signs.—These are sub-crepitant, mucous, sibilant, and sonorous râles. It is said by Laennec, that we frequently have all the sounds in chronic bronchitis quickly following each other, which he calls, "*cantus omnium avium*" (the song of all the birds.) If the disease be mostly confined to the extreme ramifications of the bronchi, the sub-crepitant râle will be predominant; if the larger tubes, the sibilant. If the larger tubes are the seat of the disease, the sonorous râle will indicate it.

Diagnosis.—Chronic bronchitis is often confounded with tubercular phthisis. It may be distinguished by the following:—In chronic bronchitis, the face is pale and the lips blue, the cough from the commencement is attended with a copious expectoration, while in tuberculous phthisis, the lips are apt to be reddish, and the face flushed, and there is a dry cough long before there is any expectoration.

In tubercular phthisis a dull sound is elicited by percussion over the upper part of the lungs; in chronic bronchitis the sound is but slightly changed. A hoarse, harsh, inspiratory sound with an increased intensity and expectoration is detected in the early stages of phthisis, while in chronic bronchitis there is heard either the sonorous or sibilant rhonchus in the early stages, and the mucous or submucous râle in the latter.

Anatomical Characters.—The mucous membrane may be found upon dissection, thickened, partially indurated, softened or ulcerated. In some cases its color is of a deep-red, violet or brownish hue, in others grayish, whitish, or only of a slightly reddish tinge, being usually lined with purulent mucus or pus. The extreme tubes are frequently distended with the pulmonary secretion, and the bronchial glands enlarged and softened. Constriction of the tubes is sometimes observed, which may completely close them, owing to the thickening of the mucous membrane, or the entire wall of the tube. More or less emphysema of the lungs is generally found in fatal cases of chronic catarrh.

Prognosis.—In its worst forms, chronic bronchitis is a dangerous affection, though it frequently continues for many years. It is more fatal indirectly than directly, by debilitating the system, and deteriorating the lungs, thus causing the patient to sink under the supervention of acute inflammation, whether of the bronchia or any other part of the respiratory apparatus. Patients frequently die of some cardiac affection, which may be the cause, and probably the result, of the bronchial difficulty. Extensive enlargement of the bronchia with chronic inflammation is an unfavorable symptom. In determining the degree of danger from chronic bronchitis, it is important to ascertain whether it be dependent upon some more serious disease, such as phthisis, etc.

Treatment.—The treatment of chronic bronchitis must depend very much upon the age, condition of the patient, and circumstances producing it. When the result of syphilis, the constitutional and topical treatment for that disease should be instituted. If caused by rheumatism, colchicum, acetate of potash, macrotin, and occasional purges accompanied with vegetable tonics, is the treatment indicated. When associated with a scrofulous or phthisical con-

stitution, I have found the following combination of great value:—Take Mecca oil, two ounces, cod liver oil, two ounces, simple syrup, four ounces, hypophosphite of lime, iron and potassium of each one dram, essential tincture of stillingia sylvatica, one ounce. Mix, dose, one teaspoonful in a wine glass full of port wine four or five times a day. When there is considerable bronchial irritation, the inhalation of the vapor of hot water, four or five times a day will prove beneficial.

The vapors of carbonate and muriate of ammonia, iodide of potassa and of ammonia have also been extensively used, and in many instances proved beneficial. When there is a troublesome cough, I have frequently relieved it by allowing the patient to inhale the vapor of a decoction of aconite, and in case the expectoration is difficult, the vapor of lobelia may be used. When the bronchial mucous membrane is in an ulcerated condition, ten grains of argenti nitras may be added to four ounces of water, and the vapor be inhaled by means of the atomiser two or three times a day. I have also found great benefit from the inhalation of the vapor of Mecca oil four or five times a day. At the same time the irritating plaster may be applied to the upper portion of the chest, and remain until a free discharge ensues. When the stomach is in a feeble condition, and digestion weak, the following may be taken, either in alternation with the prescription previously mentioned, or at intervals. Take chamomile flowers two ounces, the pulverized bark of euonymus atropurpureus, one ounce, carbonate of iron two drams, mix, and add to a quart of port wine, and let the patient take one half wine glassful four times a day, before each meal, and upon retiring. When there is enlargement of the bronchial glands, the iodide of potassa and chimaphillin, in the proportion of one dram of the former to one half dram of the latter, triturated in four ounces of simple syrup, and one teaspoonful administered four or five times a day, will prove of great value. The compound syrup of tar and prunus virginiana have also proved beneficial in some cases.

A bad case of chronic bronchitis which came under my treatment was cured by the above syrup in combination with the frequent inhalation of the vapor of tar, and the liberal use of iron and tonics. A medical friend relates to me many cures which he has affected by

means of the inhalation of the vapor of verbascum thapsus and the use of general tonics.

The practice of using expectorants in this disease I believe to be very pernicious, as in all cases, they not only debilitate the bronchial capillaries, thus increasing the inflammatory condition, but from their peculiar power to disorder the stomach, and render digestion imperfect, they greatly tend to hasten tuberculous phthisis. In some cases I have found a few doses of the acetic syrup of sanguinaria canadensis to be of benefit, but even that should not be long continued. Cod liver oil in other forms and combinations, besides that which we have mentioned, may also be used. I have frequently prescribed the following with happy effect. Take cod liver oil one ounce, simple syrup four ounces, tincture of aconite leaves one dram, carbonate of iron and common salt of each one dram. Mix, and let the patient take a teaspoonful every three or four hours in a little porter or wine. The patient should take all the out-door exercise possible, and partake of as strong a diet as his stomach will digest. I have known some cases much benefited by applying cold packs to the throat, and even cupping and leeching have been resorted to with reputed success.

The cough may be temporarily relieved by taking a few doses of equal parts of the tincture of aconite and chloroform, or by the one twentieth of a grain of the triturated aconitin four or five times a day. I have used one drop of the oil of stillingia four or five times a day with advantage in a few cases. It should be triturated with sugar before being taken. A large number of cases of confirmed bronchitis have been permanently cured by going to the Mecca oil wells, and drinking large draughts of the water mixed with the oil as pumped from the wells. Sea bathing and Saratoga water have also proved beneficial in many cases.

CROUP.

Croup (trachealis, tracheitis, laryngeo-tracheitis) is a psuedo-membranous affection of the glottis, larynx and trachea, consisting of a specific inflammation, characterized by a convulsive cough, crowing respiration and great dyspnœa.

Croup is peculiarly a disease of early life, and affects males

more frequently than females. Its visitation is chiefly to be apprehended between the periods of weaning and puberty.

Pathology.—In the majority of cases, the inflammation commences in the mucous membrane of the larynx, extending into the trachea, or it may begin in the bronchi and reach the larynx, but there are very few instances in which the trachea is only the seat of the disease. In fatal cases of croup, the pseudo-membranous exudation is found only in the larynx and upper portion of the trachea, or it may be present only in the latter when death occurs at a later period, but it never exists in the bronchi alone. Some writers have tried to demonstrate that the ordinary form of croup is simply a tracheitis, and that the more violent and rapid are confined to the larynx. Numerous dissections have proved however, that this theory is not strictly correct, yet in violent cases, the indications of inflammation are greater, and the pseudo-membranous exudation more copious about the larynx, glottis and upper portion of the trachea, than in those of a milder character.

The breathing is obstructed by this exudation, and by spasmodic contractions of the muscles of the larynx, diminishing the calibre of the air-tube, while spasms are produced by partially detached fragments. The mortality of croup is very great, death resulting in many instances from asphyxia, or a deposit of fibrin in the heart.

Symptoms.—Croup is usually preceded by sneezing, coughing, hoarseness, drowsiness, suffusion of the eyes, chills and fever. In about twelve or twenty-four hours, the respiration becomes sharp and whistling, the paroxysms of hoarse coughing more numerous, and an occasional spasmodic action of the laryngeal muscles. The child is feverish and fretful, does not sleep well, and upon waking, or being roused, the voice and respiration produce a peculiar sonorous shrill, crowing sound, which is heard in the larynx, and more or less along the trachea to its bifurcation. There is also a constant expectoration of a thin, glairy fluid, consisting of an albuminous exudation from the mucous membrane of the trachea, the result of the inflammatory action. This exudation forms one of the most prominent characteristics of genuine croup. In connection with this, there is usually more or less hoarseness, which sometimes amounts to aphonia. This loss of voice is always an indication of extensive

engorgements of the trachea, larynx and pharynx. Upon inspecting the fauces, the tonsils will be found gorged, red and œdematous. By the use of the laryngoscope, this hyperæmia may be observed to extend even below the bifurcation of the bronchi, and the entire mucous surface covered with a grayish, tesselated exudation, rapidly undergoing transformation into fibrous tissue. This exudation appears to be of a specific character, and instead of being composed of the ordinary albuminoid cells, a peculiar vegetable parasite, the *odium albicans*, forms the basis of the organization. This plastic exudation becomes organized as soon as effused upon the mucous surface, and in this respect differs most essentially from the ordinary transformations occurring in the exudation during the inflammatory action of mucous tissues. The ordinary change of the liquor sanguinis upon an inflamed mucous surface, is its conversion into pus-corpuscles. This we see verified in bronchitis, urethritis, vaginitis, etc. The only exceptions that are known to exist in the morphological changes in the exudation of the mucous membrane during disease, are pseudo-membranous croup and scarlatina diphtheritis. As the disease advances, the membrane becomes more permanently organized, the obstruction to respiration greater, and all the associated symptoms proportionately aggravated. This narrowing of the air passage produces hurried respiration, accompanied with a sharp, whistling sound, and frequent attacks of spasmodic coughing, with a violent effort to expel the obstruction. The child now becomes restless, tossing about in bed, grasping at its throat, throwing the head back so as to increase to the greatest extent the capacity of the trachea. The urine is scanty and high colored, the skin hot, the face and lips assume a livid appearance, and the extremeties are usually cold. In this stage of the disease, the pulse is quick, thready and compressible. These symptoms occur more violently in paroxysms, especially in the early part of the evening, and towards morning. During the interval, not unfrequently the respiration becomes quite free, and all the symptoms so far ameliorated as to lull the friends into a false security of the child's convalescence. These calms, however, are but the precursors of more violent paroxysms. As the mechanical obstruction to respiration increases, the dyspnœa, spasmodic coughing, restlessness and great anxiety are soon followed by suppression

of the pulse at the extremities, more or less delirium, exhaustion and death; or convulsions may occur, and terminate fatally.

Causes.—The nature and character of the specific cause of pseudo-membranous croup is not well understood. It is unquestionably produced by the presence of some materies morbi in the blood of a specific character, and like scarlatina diphtheritis, is a constitutional affection, the inflammation of the upper air-passages being a mere outcropping of the malady. The circumstances most favorable to the development of the disease are damp, marshy localities; thus, we find it more prevalent along the borders of the great lakes, the Western and Southern States, and in late autumn or early spring. It is also materially aggravated in malarial districts.

Diagnosis.—The only diseases with which genuine croup is liable to be confounded are laryngismus, stridulus, or spasmodic croup, and scarlatina diphtheritis. In false croup, however, there is no inflammation; the attack is more sudden, and the child is usually seized with violent spasms of coughing and suffocation, produced by a peculiar neuralgic affection of the laryngeal plexus nerves, while genuine croup is of an inflammatory character, the symptoms developing themselves consecutively and permanently. From scarlatina diphtheritis it is distinguished by the absence of the erythema, the less violent inflammatory excitement, and the absence of swelling of the lymphatics.

Treatment.—There is, perhaps, no disease where so much empiricism has been manifested as in pseudo-membranous croup. By the old school practitioners, tartar-emetic, calomel, blood-letting, blistering, leeching, scarifying and cupping have each had their advocates, while others have combined all these methods, in addition to squills, ipecac. and tracheotomy. All these plans of treatment have been equally unsuccessful, and as Dr. Tanner truthfully remarks, bleeding, tartar emetic and mercury are measures that have proved unsuccessful. He also states that blood-letting and blisters have no other than an injurious effect. The homœopathists have laid much stress upon their specific medication of this affection; thus spongia, iodine, bromine, chromic acid, and many other remedies have been claimed by this class as specifics in this disease, but from personal observations, as well as the most extensive re-

search into the merits of their practice, I am well assured that it is equally as unsuccessful as that of the old school, and we apprehend that one of the causes for this want of success in treatment is the absurd notion that it is a mere local affection, whilst every fact, as connected with its pathology, most conclusively demonstrates that it is a constitutional disease. But, as we have previously stated, croup is an insidious affection, and one that requires treatment in the early stage. If called while the disease is in the initiatory stage, a thorough lobelia emetic should be administered, followed by the application of hot packs to the throat. As soon as the emetic has operated, from one half to one grain of podophyllin, ten grains of sulphate of quinia, and fifteen or twenty grains of anti-bilious physic should be made into six or eight powders, and one given every half hour until they act as a purge. As soon as the purge operates, the specific treatment should be instituted. This consists of the acetic syrup of sanguinaria. It may be prepared as directed in "New School Medicines," under the head of Pharmacy, or by adding one teaspoonful of fresh pulverized sanguinaria canadensis to one gill of vinegar, and four tablespoonfuls of pulverized white sugar. This should be placed upon the fire until the sugar is dissolved, and the vinegar brought to a boiling heat, strain and give while warm from one quarter to one teaspoonful every half hour or hour, according to the urgency of the case. In no instance should this be administered in sufficient doses to produce vomiting, but in bad cases as much should be given as to produce slight nausea. During the administration of this remedy, the body should be frequently sponged in hot soda water, hot packs applied to the throat, and small doses of aconite administered to control febrile excitement. If not called to the case until after the false membrane has commenced to form, the emetic may be omitted, and the treatment commenced by a purge of quinine, anti-bilious physic and podophyllin, and the use of sanguinaria. In some bad cases, dry cupping may be resorted to in connection with the hot packs. During the treatment, the strength should be supported by beef tea, and if the disease be protracted, a full round of quinine and iron should be administered every two or three days. The bowels should be kept in a soluble condition by means of warm water

injections. The above treatment I have seen put to the most rigid test in malignant cases, and, where skilfully applied, with uniform success.

APHONIA.

Aphonia may occur as a functional disorder, or be associated with inflammation or lesions within the larynx, and may vary from a slight impairment to complete loss of voice. This form is usually met in females, and is generally associated with hysteria. The functions of the uterus may be disturbed, resulting in amenorrhœa, leucorrhœa, dysmenorrhœa, or menorrhagia. The patient usually speaks in a whisper for days, then the voice returns, but usually there are many relapses. When the disease continues any great length of time, the vocal chords may become flaccid or powerless.

Causes.—The most frequent cause of nervous aphonia is general debility or weakness, after protracted or exhausting diseases. It may depend upon debility of the muscles of the larynx, caused by excessive efforts in speaking or singing. Sudden and strong mental emotions occasionally bring on an attack. Sudden exposure to cold, intestinal irritation, diseases of the sexual system, the use of powerful narcotics and affections of the nervous centres give rise to a suppression of the voice.

Organic suppression is produced by inflammation, serous infiltration or ulceration of the mucous membrane about the vocal chords, the pressure of morbid growths near the larynx, and congestion or effusion of the brain, or some other cerebral disorder.

Treatment.—When aphonia is produced by a disordered condition of the nervous system, cypripedin, scutellarin, strychnine, and iron are the remedies, together with country air, baths, and a nutritious diet. When produced by organic lesions, the treatment depends altogether upon the nature of the affection. If associated with lesions of the vocal chords and mucous membrane of the larynx, the treatment is already designated under that head. When connected with functional diseases of the uterus, and manifested as a species of hysteria, bebeerine, macrotin, iron, sitz baths, and gelsemin are remedies which, if properly used, will remove the difficulty.

PNEUMONITIS.

Pneumonia, or acute inflammation of the parenchyma of the lungs, is a serious affection, commonly preceded by restlessness, chills, and general febrile excitement, a quick pulse, rapid respiration, thoracic pains, cough, expectoration, anorexia, thirst, cephalalgia, prostration, etc.

Acute pneumonia is characterized by four stages, hyperæmia, or congestion, effusion or exudation, hepatization, and ramollissement.

Symptoms.—In each stage, there is fever, more or less pain in the chest, rapid and oppressed respiration, depression, delirium, and cough with expectoration. The latter symptom is characteristic, consisting at first of a dry, glairy mucus, which soon becomes more viscid and rusty colored. The sputa upon microscopical examination is found to consist chiefly of mucus, epithelium, liquor sanguinis, exudation, blood cells, oil-globules, and chloride of sodium.

There is increased frequency of respiration varying from forty to eighty per minute. The pulse, though rapid, does not always proportionately increase. The febrile phenomona are usually severe, cephalalgia is frequent, delirium rarely occurs. The heat of the skin is intense, and the flush of the cheek so decided, that by this and the rapid respiration alone, the affection may frequently be recognized.

The urine is scanty and high-colored. In the clinical cases reported by Dr. Bennett, we find the following statement: In a case of pneumonia on the right side complicated with pleurisy, heavy sediments of lithates were observed during the active stage. In a case of double pneumonia in the same stage the urine was scanty, high-colored, and deficient in chlorides. In another case of pneumonia on the right side, where there was early bleeding, but slow recovery, the chlorides were abundant, with heavy deposits of lithates, although in this case it appears that this did not occur until after the close of the tenth day. Simon remarks that albumen is found in a large proportion of the cases.

Upon making a physical exploration of the chest, there will be slight dulness upon percussion during the stage of *congestion*, with an increase of fremitus. If the pneumonia is confined to one lung, there will be an increase of capacity detected upon mensuration.

The expiratory murmur is usually prolonged, and the inspiratory proportionately shortened. Upon auscultating the chest, the normal respiratory murmur will be found gradually diminished, as we approach the stage of engorgement, until it becomes mingled with minute crepitation. If the hyperæmia be extensive, the crepitant râle is heard to the entire exclusion of normal respiration. As the disease advances to *hepatization*, the crepitant râle is gradually lost, and as hepatization becomes perfect, is altogether superseded by bronchophony. Percussion elicits a dull sound, which, where the hepatization is extensive, amounts to complete flatness.

During the second stage, or that of *exudation*, the dry crepitant râle which is detected in the early form gives place to the moist sub-crepitant, and if the inflammation extend to the minute bronchi, to the sibilant râle. In this stage, the cough, which has previously been dry and harassing, proves less troublesome, and is connected with more or less expectoration of the characteristic sputa.

If the disease passes into the third stage, or that of *hepatization*, the cough again becomes dry, and the expectoration scanty. It is in this stage, that the febrile symptoms become aggravated. There is also great prostration, restlessness, complete anorexia, constipation, a loaded brown tongue, sordes upon the teeth, and hurried and imperfect respiration. If it be double pneumonia, the blood becomes imperfectly oxidized, extensive sedation of the nervous system occurs, the sleep is disturbed, and there is typhomania.

As the disease advances to the fourth stage or, that of *softening*, the symptoms become aggravated, and if portions of the lung give way, vomicæ or cavities are formed, which may be detected by cavernous respiration, metallic tinkling, and increased resonance over the site of the disease.

The *pathological* conditions of these stages, are that during the stage of hyperæmia, the pulmonary capillaries become over-distended with blood, which at first circulates through them with great rapidity, but gradually becomes sluggish as the pulmonary capillaries become exhausted. As soon as this occurs, exudation commences, and the liquor sanguinis is infiltrated into the pulmonary tissue, portions of which escape into the air cells and minute

bronchi, constituting the rusty sputa of pneumonia. If the portion of exudation remaining in the pulmonary tissue, undergoes granular degeneration, then hepatization is said to exist. If the granular degeneration consists entirely of the liquor sanguinis, it is denominated *grey hepatization,* but if the exudation consists of liquor sanguinis and blood cells, the color of the granular matter becomes changed, and *red hepatization* is the result. The solution of this granular matter or liquor sanguinis, and pus corpuscles, when connected with a destruction of the continuity of the pulmonary tissue, constitutes the fourth stage, or that of softening.

In some instances large abscesses form. Upon microscopical examination, we observe that parts of the lung tissue are infiltrated with granules, and are undergoing softening.

If the inflammation subside before this process commences, the hepatized condition may cease, or remain permanent. If the former be the case, the air will slowly re-enter the lung, as indicated by the crepitant râle, mingled with, and subsequently superseded by the healthy vesicular murmur.

In debilitated constitutions, acute inflammation may terminate, though rarely, in gangrene; it may be limited in extent, or occupy a large portion of the lung. Its color is dark, of a dirty yellow, or greenish-brown hue. The physical signs are those of softening and excavation of the pulmonary tissue. There are great dyspnœa, prostration, and an intolerably offensive odor. Sphacelation may also arise from tubercle, cancer, hemorrhage, the presence of morbid poisons in the blood, and disease of the brain producing perverted innervation of the lungs. It is occasionally the sequelæ of eruptive or exanthematous fevers in children, or an accompaniment of cancrum oris.

Pneumonia may be double or single; the right lung, however, suffers much more frequently than the left. The upper lobes are less liable to inflammation than the lower.

Bronchitis constantly accompanies inflammation of the parenchyma. The mucous membrane is of a red color, both in the large and small branches of the air-passages. Pleurisy may also be associated with it, and when it forms the prominent disease, the affection is styled *pneumo-pleuritis,* and when the pneumonia predominates, it is sometimes called *pleuro-pneumonia.*

Dr. Boling, of Alabama, states that he has frequently observed a deposition on the teeth, along the margin of the gums, of a matter of different shades of color, from light orange to a deep vermilion, owing probably to an exudation from the margin of the gums, or miasmatic poison.

Lobular Pneumonia.—Lobular pneumonia occurs most frequently in children under the age of six, though in some instances, it is observed in adults. It is generally preceded by symptoms of a mild bronchitis followed by increased heat and dryness of the surface, increased frequency of pulse, accelerated respiration, dyspnœa, and a short dry cough. These symptoms are quickly aggravated, the lips are of a bright red, the tongue of a florid hue, somewhat dry, and coated along its centre with a thick white fur. From the commencement of the attack, there is often vomiting and diarrhœa. There may be great agitation and anxiety or drowsiness, or more rarely, convulsions. In infants at the breast, the breathing is no longer affected solely through the nose, but they lie with the mouth partly open, and breathe through it. The child sucks by starts, and then suddenly dropping the nipple, commences to cry or moan. There is anorexia, urgent thirst, a torpid state of the bowels, and when the disease is complicated with enterits, profuse diarrhœa may be present. In such cases furunculi or ecchymoses cover the derma, and the blistered surfaces are liable to become ulcerated. In favorable cases, the symptoms attain their greatest intensity about the fourth, fifth, or at the farthest, by the ninth day, the heat of the skin, and the frequency of the pulse diminish, the respiration is slower, the alæ nasi cease to contract, the cough becomes more free and moist, the fever quickly disappears, the face is paler, and the expression of the countenance more natural, and in a few days convalescence is fully established. In the severe and unfavorable cases, there is intense dyspnœa, anxiety, a pallid hue of the face, rapid pulse, a frequent, short and painful cough, great emaciation, and constant diarrhœa, and at the termination of from three to four weeks, the patient expires. Death may also be hastened by the occurrence of pleurisy, rubeola, cancrum oris, etc. In the simple form of pneumonia, the crepitant râle, and frequent bronchial respiration are heard on one side of the thorax to its base. In the lobular form, the sub-crepitant râle is more generally dif-

fused, while the bronchial respiration is seldom heard. When the symptoms are at their height, the bronchial inspiration is perceptible, and accompanied with bronchophony, or with a resonance of the voice, and extensive dulness of the chest. As the general symptoms decline the subcrepitant rhonchi are abundant, the vocal resonance extends over a larger space, and the bronchial respiration continues. Even after convalescence is established, a slight prolongation, as well as a different resonance of the voice is still perceptible. In more violent cases, hurried râles are heard throughout the chest, mingled with bronchial expiration, and a diffused vocal resonance.

The anatomical characters of lobular pneumonia in children are the same as those met with in the pneumonia of adults.

Bilious Pneumonia.—Pneumonia is frequently associated with symptoms of bilious derangement. In malarial districts, or in localities where bilious fever is a prevailing disease, in the spring and fall, or during the winter months, while the air is cool or damp, and sudden changes frequent, patients suffering from poisonous paludal exhalations, are often attacked suddenly with pneumonia.

Symptoms.—The patient is found in a half sitting posture, slightly turned upon one side. His face presents a livid appearance, his respiration is difficult, there is a dull heavy pain in the side and a frequent cough. The sputum may be rusty-colored, or consist of a frothy and bloody serum or pure blood. There is a bitter taste in the mouth, loss of appetite in the morning, slight constipation of the bowels or diarrhœa, a yellow appearance of the urine, headache, more or less coldness in the morning, and slight thirst at night. By inspection, the affected side is found not to expand at each inspiration. Percussion elicits a dull sound, and auscultation detects a want of the natural respiratory murmur, and the presence of the sub-crepitant râle.

Typhoid Pneumonia.—Pneumonia assuming a typhous form may occur in persons of enfeebled constitutions, or those who have been exposed to depressing influences. The disease is usually ushered in with a chill, the respiration is short and oppressed: there is pain, or pains in the back, limbs and other parts of the body. The muscular strength is greatly prostrated, and there is a sense of general uneasiness and great restlessness. After a period, reaction ensues,

and the heat of the surface is restored. Occasionally the skin becomes hot, dry and harsh, while again, it is relaxed, cold and clammy. The pulse, when reaction ensues, becomes somewhat fuller, quicker and more frequent. During the febrile stage, the pain, oppression of the chest, and difficulty of respiration are increased, and generally a cough ensues within the first twenty-four hours, by which the pain in the thorax is greatly aggravated. When the cough is attended with expectoration, the pain in the side is considerably relieved, and the oppression of respiration diminished. When the cough continues dry, or the expectoration is slight, all the more serious symptoms become aggravated. The sputum consists of a thick, tenacious mucus, often tinged with blood, or of an ash or dark brown color. The spirits are generally oppressed, the patient usually utters deep and heavy sighs, and complains of a sense of weight, or of constriction at the præcordia, and may be affected with nausea, or vomiting. Dark sordes may collect on the teeth and gums. The *physical signs* are dulness on percussion, and the loss of the respiratory murmur, with little or none of the crepitant râle, the place of which is supplied by the mucous sounds, or those arising from diminished caliber of the tubes.

Causes.—Sudden exposure to cold, atmospheric vicissitudes, direct injuries, over-exertion, the inhalation of irritating substances, violent mental emotions, intemperance in eating and drinking, the metastasis of gout or rheumatism, the suppression of the accustomed discharges, etc. It may also be complicated with other diseases, as variola, bronchitis, hooping-cough, scarlatina, erysipelas, phthisis, etc.

Diagnosis.—Pneumonia may be confounded with œdema, phthisis, pleurisy, and bronchitis. From the first two, it is distinguished by the history of the case, together with the symptoms developed, without any difficulty. In pleurisy, the patient lies on the healthy side: there are acute pains, little expectoration, slight dulness on percussion, and only a diminished respiratory murmur with the friction sound; while in pneumonia, there is a dull sound, an absence of the murmur, and the presence of the subcrepitant râle; the countenance assumes a livid appearance; there are dull pains, with a viscid, rusty-colored sputa, and the patient lies on the affected side.

Bilious pneumonia is distinguished from the preceding variety,

by the epidemic and endemic influences, and the locality, together with the bilious symptoms which are developed in the case.

Treatment.—The treatment of simple pneumonia should commence by sponging the surface with hot water, the application of hot packs to the chest; and if the stomach and bowels be in a vitiated condition, they should receive proper attention. When the inflammation is of a sthenic character, the respiration hurried, the pulse quick and full, from ten to thirty drops of the essential tincture of veratrum viride should be added to a tumbler of water, and a teaspoonful administered every ten or fifteen minutes until these symptoms are controlled. As soon as the arterial excitement is subdued, a dram of the wine tincture of lobelia should be added to a tumbler of water, and a teaspoonful given every ten or fifteen minutes, instead of the veratrum. Lobelia has a specific influence over pulmonary inflammation, and can be relied on in all cases to control inflammatory action in this tissue. It should, however, be administered in small doses. I have frequently controlled violent cases of inflammation of the lungs after instituting the appropriate preparatory treatment, by administering one drop of the wine tincture of lobelia every ten or fifteen minutes, in connection with hot packs. If the lobelia be administered in the early stage of this disease, it will usually cut short the inflammatory process, and produce a termination by resolution. After extensive exudation occurs, the lobelia treatment will hasten expectoration, relieve the cough, and prevent the farther advance of the inflammatory process. If the disease have advanced to hepatization, the lobelia should be administered to prevent an extension of the inflammatory action, and from one to two grains of iodide of ammonia administered every two or three hours, for the purpose of absorbing the granular matter which has become infiltrated into the connective tissue of the lung. If there be indications of softening in any portion of the hepatized lung, one drop of the tincture of phosphorus should be administered. It can be taken in the syrup of tolu, or that of prunus Virginiana, every two or three hours.

When the disease is associated with a *bilious* habit, leptandrin and leontodin should be given. I have usually been in the habit of administering five or ten grains of leontodin, and four or five of leptandrin every two or three hours, in connection with the lobelia

treatment, until free bilious discharges occur. If the disease be associated with a malarial influence, as it usually is when of a bilious character, a course of quinine and iron should be administered every five or ten days. In cases of this character, where I have been called in the advanced stages of the disease, and there were high fever, great difficulty of breathing, a dry and harassing cough, restlessness, and great anxiety, I have produced almost immediate relief by the following compound:—Take the oleo-resin of lobelia, five grains; sulphate of quinine, ten grains; prussiate of iron, one dram. Mix, and make twenty powders. Dose, one every two hours. When the fever is of an adynamic character, and there is a feeble constitution, the tincture of aconite should be used instead of the veratrum in the early stage, and the lobelia should be given in much smaller doses. If there be great prostration at any period of the disease, from five to ten grains of capsicum may be administered in a wine-glassful of cream two or three times a day. If the expectoration be difficult, a wine-glassful of flaxseed tea, in connection with half a teaspoonful of lemon juice, taken every two or three hours, will generally relieve it. If this should fail, a tablespoonful of the syrup of eupatorium perfoliatum may be taken as often as required. The syrup of verbascum thapsus and althæa officinalis have been used for the same purpose with happy effect. If there be restlessness and disturbed sleep, two or three grains of lupulin, and one or two of cypripedin may be taken at night. When there are *typhoid* symptoms associated with great prostration, carbonate of ammonia and prunin should be administered three or four times a day, in the proportion of three or four grains of the latter to four or five of the former. The ammonia should be dissolved in a wine-glass of water, and the prunin thoroughly triturated with sugar. Where there is extensive breaking up of the pulmonary tissue, I have found great benefit derived by adding one dram of the oil of solidago, and one of the oil of turpentine to four ounces of the mucilage of gum Arabic, and administering a teaspoonful every two or three hours. It is in this stage of the disease that the inhalation of the vapor of the decoction of cinchonæ, prunus Virginiana, and eupatorium perfoliatum, has proved beneficial. Dr. Tanner recommends the pouring of turpentine upon boiling water, and inhaling the vapor. The packs should be maintained on the chest during the

active stage of the disease; and during that of hepatization and softening, chafing liniments with friction, will prove serviceable. The strength of the patient should be well supported by cream and water, chicken broth, beef tea; and after all inflammatory symptoms have subsided, Scotch ale and light wines. The bowels should be kept regular by means of warm water enemata; and when the chlorates are absent from the urine, two drams of the acetate of potash may be dissolved in six ounces of water, and one tablespoonful administered every two or three hours. Fresh air, quietude, and rest, with frequent ablutions, or spongings of the body, are also essential in the treatment of pneumonia.

ASTHMA.

Asthma is a nervous, spasmodic affection, characterized by difficult breathing, occurring in paroxysms, accompanied by a wheezing sound, oppression of the chest, cough, and expectoration, being unattended with fever, or any organic disease of the heart or lungs. The paroxysms may be induced by a spasmodic contraction of the larynx, trachea, or bronchial tubes, and congestion of their lining mucous membrane. The medulla oblongata, the cervical and pneumogastric nerves are immediately involved in the paroxysms, and it is probable that this disease results from an irritable state of the cerebro-spinal system, owing to which the medulla oblongata becomes the seat of local congestion. This condition deranges the flow of nervous influence through the cervical and pneumogastric nerves, producing the spasmodic symptoms characteristic of the disease.

Symptoms.—The premonitory symptoms of asthma are a sense of fulness in the epigastrium, anorexia, flatulency, eructations, headache, sleepiness, languor, chilliness, and general nervous irritability. The attack generally occurs at midnight, the patient being seized with great anxiety, a sense of tightness and constriction about the chest, difficult breathing, and a distressing cough, the dyspnœa increasing gradually until a fearful and painful struggle for breath ensues. He assumes various postures to facilitate in emptying and filling the lungs, standing erect, or sitting forward, with his knees drawn up, his elbows on his knees, and his head supported by his hands, or he may rush to the open window, even

in very cold weather, at which he will remain for hours, gasping for air. That he can do so without any injurious effect, is a strong evidence that the nervous system is the principal seat of disease in these cases. The chest is distended to its greatest extent, inspiration and expiration are difficult, and there is evidently some serious obstruction to the entrance and exit of the air. Upon auscultation, the sibilant rhonchi, loud wheezing, or sharp whistlings are heard. The countenance and the general movement of the patient express indescribable anxiety and suffering. The face is either pale, flushed, or shrunken, the eyes prominent, the veins of the head, neck and face turgid, the pulse small, feeble, irregular, and intermittent, with palpitations of the heart, the extremities cold, and the head and breast covered with a cold, clammy perspiration, owing to the fatigue produced by the respiratory efforts. The urine, during the paroxysm, is copious, watery, pale, clear, and œdematous, resembling that characteristic of hysterical females. The bowels, in some instances, are suddenly relaxed at the commencement of the attack. There may be a disposition to cough, and speaking is difficult and imperfect. After these symptoms have continued for a length of time, a remission takes place: by degrees the breathing becomes less laborious and fuller, and towards morning a more or less copious expectoration of mucus occurs, and the most distressing symptoms are soon relieved. When the symptoms subside without any expectoration, the disease is styled *dry asthma;* but when this phenomenon is present, it is characterized by the name of *humoral* asthma. During the day the patient feels comparatively well, although there may be soreness of the muscles, neuralgic pains, constriction of the chest, a wheezing inspiration, and an aggravation of the dyspnœa upon muscular exertion, or by assuming the horizontal position. As night approaches, the paroxysms of difficult breathing return, and thus the disease may recur successively each night, remitting at length in their severity, before a final subsidence takes place.

When asthma is uncomplicated, it may remain for a long time without materially affecting the general health of the patient. Frequently it is associated with cardiac affections, and emphysema of the lungs. It sometimes assumes a chronic form, continuing for several weeks, with only slight remissions during the day, and exa-

cerbations at night, in which variety it is attended with a troublesome cough, a considerable expectoration of mucus, and difficulty of breathing.

Asthma is incident to both sexes, but is much more common among males. It is frequently hereditary, and sets in at any time of life, but belongs more to adolescence and middle age than to its extremes. Asthmatic patients are thin and round-shouldered, with hollow cheeks, a hoarse voice and slight cough, and an anxious expression of the countenance.

Causes.—Some individuals are hereditarily predisposed to asthma; but it may arise from a variety of exciting causes, as atmospheric vicissitudes, the desiccation of accustomed discharges, the retrocession of gout or rheumatism, the inhalation of irritating substances, such as dust, cold air, certain vapors, and emanations from hay, ipecacuanha, and mustard, masturbation, onanism, or excessive venery, profuse evacuations, plethora, strong mental emotions, improper food, or meals taken irregularly, despondency, protracted illness, organic cardiac affections, spinal irritation, etc. The influence of particular climates is well known, the disease prevailing mostly in moderately cold and moist regions. Dr. Chowne observed a case of asthma produced by the application of cold to the instep.

Anatomical Characters.—The only appearance characteristic of uncomplicated asthma are lesions of the brain, spinal marrow, or par vagum.

Prognosis.—Spasmodic asthma rarely terminates fatally. Many who are subject to it live to a good old age; and even if there be an hereditary predisposition, it may in course of time be entirely overcome. The disease, however, assumes a serious character, when it induces congestion of the lungs, emphysema, and hypertrophy and dilatation of the right side of the heart. When any of these complications are thoroughly established, the life of the patient becomes more and more miserable by cough, copious expectoration, orthopnœa, œdema, venous regurgitation, and cyanosis, which are finally followed by somnolence, coma, and death.

Treatment.—The treatment for asthma has been reduced to a simple form, and if correctly applied, is most radical in its effects. It consists in relieving the paroxysms in the first instance, and then producing such an influence upon the cerebro-spinal system as to prevent their recurrence. They can be almost instantly relieved

by inhaling the ethereal tincture of lobelia inflata, which should be prepared by adding one pound of sulphuric ether to two ounces of fresh lobelia seeds, tincturing for fourteen days, and then filtering. The ethereal tincture should be inhaled by saturating a sponge with it, and allowing the patient to inhale it freely, until the breathing is relieved, which will usually occur in a very short time. In a few instances, I have been compelled to continue it until nausea and vomiting ensued. As soon as the paroxysm is over, the following compound should be given:—Take oleo-resin of lobelia, one dram; sulphate of quinia, two drams; ferro-ferricyanidum, four drams. Mix, and make one hundred and twenty powders, and give one every three hours in a tablespoonful of strong cold coffee. These should all be taken; and if the paroxysms return during their administration, the ethereal tincture should be resorted to, to relieve them. If the disease be complicated with other affections, remedies should be given to remove them. Instead of the inhalation of sulphuric ether, I have occasionally resorted to the following:—Take acetic tincture of lobelia, one ounce; tincture of gelseminum sempervirens, half ounce; fluid extract of cypripedium pubescens, two ounces. Mix. Dose, one teaspoonful every ten or fifteen minutes until the paroxysms are relieved, or vomiting produced. Many other plans of treatment have been adopted to relieve the dyspnœa, such as the inhalation of the fumes of nitrate of potassa, the vapor of opium, lobelia, tobacco, gelsemin, etc.; but from my experience with these methods, I find them far inferior to the ethereal tincture of lobelia, to which I have alluded. This treatment has proved most uniformly successful in a large number of cases which I have treated. When it fails, the iodide of potassium, as recommended by Dr. Tanner, may be given. His formula is as follows:—Take potassi iodidi, twenty grains; tincturæ serpentariæ, three fluidrams; mistura guaiaci, eight fluidounces. One-sixth part to be taken three times a day. Nitric acid, in five or ten drop doses, has been recommended, as has also hydrocyanic acid, in one or two drop doses, two or three times a day. The tinctures of belladonna and stramonium daturia, in proper doses, have also been highly recommended. The general health should receive especial attention; and whenever the exciting cause can be ascertained, it should be removed, if practicable.

HAY ASTHMA.

Hay asthma is a peculiar catarrhal affection, ascribed to the inhalation of the aroma of spring grass and hay, or from the perfume of the Nardus stricta, a grass which is very abundant in many grazing fields. It consists in excessive irritation of the eyes and nose, and the whole of the air-passages, producing itching of the eyes and nose, sneezing, copious discharge from the nostrils, pricking sensations in the throat, a dry, harassing cough, tightness of the chest and difficult respiration, with or without considerable mucous expectoration. The inhalation of the ipecacuanha produces, in some susceptible persons, symptoms similar to those above described.

Treatment.—The treatment of hay asthma consists in removing the cause, and relieving the paroxysms by the inhalation of the ethereal tincture of lobelia, or ten or fifteen drops of lobelia tincture, and one or two of the tincture of gelseminum may be given every fifteen or twenty minutes. Afterwards the same treatment may be instituted as in other forms of the disease.

ACUTE PLEURITIS.

Pleuritis, or pleurisy, is characterized by an inflammation of the pleura, or the serous membrane enclosing the lungs and lining the cavity of the thorax; only one side is usually affected, but there may be double or lateral pleurisy.

Symptoms.—Acute sthenic pleuritis usually commences with a chill, which is soon succeeded by a sharp lancinating pain in the side, cough, short and quick breathing, and fever.

The *pain* may come on either before, at the same time, or a short time after the chill. In character it is severe, as if resulting from the thrust of an instrument, and hence it is often called a *stitch* in the side. Usually it is felt somewhere in the mammary region; but it may be experienced near the lower margin of the chest, in which case it is, probably, the result of inflammation of that part of the pleura which covers the diaphragm. In most instances it is confined to one place; but it may be diffused over the surface of the chest, being of a sudden, sharp and severe character.

It is so nearly simulated to the nervous pains in hysteria, that

it may lead to error in diagnosis. It is increased by inspiration, cough and motion, and aggravated by lying upon the affected side, and by pressure over the intercostal spaces. There is for a day or two after the occurrence of the most severe pain, a great degree of soreness externally. As the effusion increases, the pain decreases in consequence of the separation of the inflamed membranes by the fluid, and the prevention of friction. It is, in some cases, almost entirely wanting, being perceptible only by soreness on pressure.

The *cough* is usually short and dry, attended with but little expectoration of mucus or frothy matter. Sometimes a more copious expectoration is present. When the pleuritis is complicated with a degree of bronchitis, it is occasionally somewhat bloody. Severe pain often attends it, to avoid which, the patient tries to suppress the cough, and to a certain extent he succeeds in the effort. In some cases, however, this is wanting. When such is the fact, and there is at the same time no pain, the disease, by some authors, is called latent pleurisy.

The *breathing*, in most cases, is more or less difficult. The pain prevents a full, deep inspiration. The patient is said to have a catch in his breath. In consequence of this, less air is taken into the lung when the pleura is affected, and the frequency of respiration is therefore increased. Inversely, as the quantity of inspired air at each inspiration decreases, the dyspnœa, increases. The effused fluid filling up the space usually occupied by the lung, causes this symptom.

The function of one lung is more or less suspended, and the action of the other increased beyond its normal degree, so that the breathing of the patient becomes painful and difficult. This is more particularly the case when the effusion is both sudden and copious. When gradual, the system accustoms itself to the abnormal condition of the respiratory organs. In the latter stage it is most severe.

The *decubitus* has been considered as a pathognomonic sign of the disease. Yet there is much variance among observers in respect to this symptom. This results from the variation of the decubitus in the different stages. At first the patient cannot lie upon the affected side, owing to the increase of pain which that position produces. At a later stage, when the effusion separates the inflamed

surfaces, the pain resulting from the position of the two portions of the pleura becomes less, and sometimes is entirely wanting. When the decubitus is on the sound lung, the weight of the effused fluid, pressing on the mediastinum, forces it beyond the median line, preventing the ingress of air into the sound lung, and causes painful dyspnœa; and, consequently, at this period of the disease, the decubitus is most free from unpleasant sensations on the affected side.

The *fever* is usually considerable, and attended with the most common phenomena of febrile affections. The pulse is quick, sometimes rising to over a hundred beats in a minute, hard, full and tense. The skin is dry and hot, particularly over the chest, or the seat of the disease.

The tongue is parched, the urine scanty and high-colored, and occasionally there are cerebral symptoms.

Of the fever there are often daily remissions and exacerbations, the former coming on in the morning, the latter in the afternoon or evening. In four or five days it moderates considerably.

Causes.—Sudden exposure to cold or dampness, when in a state of perspiration, is the most frequent cause of pleurisy. It also is produced by the retrocession of erysipelas, gout, rheumatism, etc. Dysmenorrhœa, owing to exposure to cold, sometimes produces pleurisy. It may also be excited by a miasmatic condition of the atmosphere, or may depend upon the pre-existence of tubercle in the lung, or mechanical injuries.

Treatment.—In strong and plethoric individuals, when there is a marked case of sthenic pleuritis, the stomach should be thoroughly evacuated by a lobelia and bone-set emetic, followed by an active cathartic of jalapin and cream of tartar. The affected side should be packed with hot water, and the patient required to take from five to ten drops of the tinct. veratrum viride every half hour, until the symptoms of the disease abate. After which, the following compound should be given:—Take asclepin, twenty grains; gelsemin, two grains; white sugar, thirty grains. Triturate, divide into ten powders, and give one every three hours. The patient should drink freely of some diuretic mucilage, such as marshmallow or flaxseed.

If the case be one of asthenic pleuritis, the emetic and cathartic should be omitted, and hot packs applied to the side or sides, and

the tinct. of aconite given to control the inflammatory action, say from one to five drops every one or two hours. Also give the following compound:—Take asclepin, twenty grains; sanguinarin, ten grains; quinine, ten grains; white sugar, thirty grains. Triturate, mix, divide into ten powders, and give one every two or three hours. If the disease be not subdued, the following compound may be given:—Take eupatorin, twenty grains; sanguinarin, ten grains; apocynin, ten grains; white sugar, thirty grains. Triturate, mix, divide into ten powders, and give one every three hours. If there should be extensive effusion, take syrup of marshmallow, three drachms; iodide of potassium, thirty grains. Mix, and give one teaspoonful four or five times a day. When there is much debility, beef tea, wine, porter, in connection with iron per hydrogen, should be freely given. The surface should be thoroughly bathed, and the patient remain quiet in bed. If expectoration be difficult, small doses of lobelia may be given three or four times a day. When there is a tendency of the disease to assume a chronic form, an irritating plaster should be placed over the seat of the disease, and allowed to remain until a free discharge ensues. The patient's strength should be supported by vegetable tonics and chalybeates. I have frequently cured mild cases by adding ten grains of triturated asclepin to four ounces of water, and administering a teaspoonful every fifteen or twenty minutes, in connection with a large hot roller to the chest. In very severe cases, however, a thorough spirit sweat, and four or five grains of Dover's powder may be required to aid in controlling the inflammation. Twenty or thirty drops of the sudorific mixture, in a wineglassful of warm tea of nepata cataria, will answer the same purpose.

CHRONIC PLEURITIS.

This disease follows the acute form, and is so closely allied to it that it may be difficult, in many cases, to determine when the acute terminates and chronic commences.

Chronic Pleuritis varies greatly in severity and duration. It may be *acute*, in respect to the degree of suffering and the rapidity of its progress; it may be *latent* in its character, and slow in the progress of the successive changes attending and consequent upon it. Between these extremes, the intermediate grades of morbid

action are almost innumerable. The term *chronic*, then, when applied to pleuritis, seems to be more of a conventional term than in respect to other diseases. In pleuritis, the transition of the *acute* to the *chronic* state is so indefinite, and the symptoms of the recent disease sometimes have so little of an acute character, while that of a long duration occasionally manifests so much greater an intensity of irritation, that the terms, *acute* and *chronic*, would seem to be less applicable to pleuritis than to other diseases. This difficulty arises form the anatomical relations of the pleura. Being a shut sac, its acute inflammation is liable to be made chronic by the retention of inflammatory products; and the chronic is liable to be changed into the acute by the irritation of effused fluids.

But, notwithstanding these difficulties, there seems to be no impropriety in ascribing to the disease, when highly inflammatory, and until the inflammatory symptoms seem to arrive at an acme, the term acute. If, after that period, lingering fever continues, evidently excited by the products of previous inflammatory action, then the term *chronic* may, with as much propriety, be applied to the disease *after*, as *acute* to the disease before the acme. In some cases, however, such an acme seems never to exist; and to these the name *sub-acute* may with propriety be applied.

Pathology.—The anatomical appearances caused by chronic pleuritis, are very similar to the acute form of the disease. Of course, the influence of time tends to produce certain modifications.

Generally we find the membranes thicker, composed of several adherent layers, the earliest deposit being harder than those subsequently formed. The character of the liquid, too, is subject to various changes in the onward progress of the disease. It is less limpid, more prone to become turbid with flocculi of a fibrinous character. In some cases, it even appears in consistence like jelly. The quantity is greater, and consequently, the displacement of adjacent viscera is much more apparent. Here and there, adhesions are often formed between the pleura and lungs, which, in some cases, enclose little sacs of fluid.

Under the best treatment, the disease, when uncomplicated, will generally advance to a favorable termination.

But it often is the case, that the morbid products cannot be absorbed, and, consequently, they remain and pass through a series of

pathological changes, sometimes ending in gangrene. Cartilaginous laminæ, bony plates, abscesses, tubercles, and hemorrhagic effusions, are among the successive steps in the progress of chronic pleuritis.

"Sometimes," says Dr. Wood, "the walls of the chest are forced inward, contrary to their elasticity, so that, when a puncture is made from without, the air rushes in to supply the vacuity produced by their resilience. In some cases, secretion goes on as rapidly as absorption, and the liquid accumulation remains for a great length of time. This is especially the case in empyema, or collection of pus in the cavity of the pleura. Sometimes the pus makes its way into the substance of the lung, and a fistulous communication is formed between the bronchi and the pleural cavity through which pus is discharged and air admitted.

"In other instances the liquid takes an external direction, and by means of ulceration escapes into the cellular tissue without the chest, and, travelling occasionally for a considerable distance, produces sub-cutaneous abscesses in various parts of the chest, which ultimately open, unless life be previously worn out. In thus travelling, the pus has been known to occasion caries of the ribs and vertebræ. Sometimes the purulent collection is found to be connected with a tuberculous vomica."

Causes.—It is sometimes difficult to determine the causes which change ordinary acute pleuritis into the chronic form. Evidently, in many cases, too much depletion, the too frequent use of mercury, and other articles making up the antiphlogistic regimen, tend to the production of chronic pleuritis. Often, when a case seems to be cured by such means, the impoverished state of the blood, caused by the use of the lancet, thus rendering the system more liable to be affected by low grades of inflammation, developes a new and unwelcome train of symptoms, admonishing the physician that the supposed cure was, after all, delusive.

Dr. Gallup, defining chronic rheumatism, says that it is acute rheumatism half cured. So, it may be said with equal propriety, that chronic pleuritis is the acute variety half cured.

Diagnosis.—The general inflammatory symptoms of acute pleuritis may gradually disappear; but, unless the morbid products of the diseased action are removed from the pleural sac, the fever will recur, and change its type, very closely resembling hectic, or be-

coming identical with it. This recurring fever is one of the most troublesome and alarming symptoms of chronic pleuritis; for in other respects the patient does not suffer in proportion to the extent or duration of the effusion.

Dr. Gerhard observes: "I once saw a patient who had performed the full duties of a sailor, going aloft with an enormous pleuritic effusion. When he returned from sea, it amounted to two or three gallons. This is an exceptional case; but it is very common to find patients who can perform many laborious occupations without much inconvenience. This is generally the case if the dyspnœa is not severe; and we find that some patients complain of little difficulty of breathing, with an extent of pectoral disease, which will give rise to great distress in other individuals.

Symptoms.—The symptoms which so frequently characterize chronic organic diseases, are extremely variable in this variety of pleurisy. These are emaciations, loss of firmness of the muscles, harshness and dryness of the skin, and slight œdema of the legs. Sometimes they are nearly as well marked as in tuberculous disease of the lungs, in other cases they are very slight; hence they constitute a diagnostic sign of the disease; and if we find them well characterized, we may regard the case as one probably complicated with tubercles. If our impression be erroneous, we will soon rectify it, as the symptoms will gradually become more decided in the latter case, and slowly disappear if the pleurisy be followed by recovery."

Diagnosis.—The diagnosis of chronic pleuritis, without the aid of the physical signs, is often very difficult. Its general symptoms simulate to those of phthisis. But the physical signs are far more reliable. When these are present, there is no difficulty in ascertaining the true character of the disease. If it be complicated with tuberculous deposition, the case should be regarded with much anxiety, for the diagnosis then becomes much more obscure, and the prognosis more unfavorable.

Physical Signs.—The physical signs of pleurisy are the dry friction sound, produced by the apposition of the two pleural surfaces during the dry or congestive stage of the disease, and the humoral sound elicited upon percussion during effusion. The dulness, however, will depend upon the extent of exudation into the pleural cavity, and the position of the patient during examination.

Anatomical Characters.—Dissection reveals a redness of the pleura, or its infiltration with small, irregular red specks, extravasation on the inner surface, or a pseudo-membranous exudation may be observed adhering to the pleura, and forming adhesions in some instances between the pulmonary and costal pleura. Pus may be found in the pleural sac, and frequently serum, sometimes filling the entire cavity.

Prognosis.—The prognosis of this disease depends much upon the extent of the effusion, the condition of the constitution, the tendency to hereditary disease, and upon the skill with which the disease is treated. If the integrity of the constitution be not too much impaired, and there is not a marked tuberculous tendency, under a judicious treatment our prognosis will be favorable.

Treatment.—The treatment of this disease depends upon the constitution of the patient. If there is still an inflammatory process going on, aconite, in connection with veratrum, gelsemin and asclepin, should be used until it is controlled. If the skin is hot and dry, the pulse quick, the urine scanty, with more or less dyspnœa and fever, the following compound may be given:—Take gelsemin, one grain; quinine, twenty grains; asclepin, ten grains; white sugar, thirty grains. Mix, triturate, divide into ten powders, and give one every two or three hours until all are taken.

If the symptoms should not subside under this prescription, the irritating plaster should be applied over the entire surface of the affected side, and a thorough spirit-sweat given; after which, the following mixture:—Take syrup of tolu, three ounces; syrup of sanguinaria, two ounces; syrup of iodide of iron, two ounces. Mix, dose one tablespoonful every two or three hours.

If there are febrile symptoms, from one to three drops of the tincture of aconite should be given every three hours, in connection with the above mixture.

The diet should be nutritious and stimulating, and if there be much debility, a small quantity of porter or Scotch ale should be taken four or five times a day. If there be much effusion, an attempt should be made to produce absorption by the following mixture:—Take syrup of iodide of potassium, one ounce; syrup of apocynin, two ounces; syrup of stillingia, three ounces; mix, dose one teaspoonful three or four times a day. At the same time drink

freely three times a day of a tea made of equal parts of eupatorium, purpureum and pipsissewa. If the strength of the patient will bear it, one-eighth of a grain of phytolaccin and five grains of cream of tartar may be given once or twice a day.

The irritating plaster should not be removed until a free discharge ensues, which should be maintained by the occasional use of the vegetable caustic, and a constant application of slippery elm poultice. If the absorbents should prove too debilitating to the patient, they may be discontinued for a few days, and the following tonic be given:—take hydrastin, ten grains: phosphate of iron, twenty grains; prunin, ten grains; white sugar, thirty grains; mix, triturate, and divide into ten powders, and give one every three hours.

If there are periodical symptoms in connection with debility, and the above prescription should fail to give relief, five drops of the muriated tincture of iron, and two grains of quinine, should be given four times a day, also a liberal supply of beef tea. After recruiting the patient's strength for some days, the diuretics and absorbents should again be resumed, and persisted in for the purpose of producing absorption of the effused fluid.

Apocynin, chimaphilin and iodide of ammonia have also been highly recommended as absorbents in this disease. In one case, where other remedies had failed, and there was a large deposit of exudation into the pleural sac, I produced absorption by the following compound:—acetate of potash, three drams; tincture of colchicum, one ounce; fluid extract of pareira brava, one ounce; water, two ounces; mix, and give a teaspoonful every half hour or hour. Small fly blisters applied to the chest, and chafing liniments may also prove beneficial. When these remedies fail, the operation of paracentesis thoracis may be resorted to.

EMPYEMA.

Empyema is a collection of fluid in some part of the body, particularly in that of the pleura. It consists mostly of a purulent, sero-purulent or serous fluid, within the cavity of the pleura, and is dependent upon chronic pleurisy. When inflammation attacks a serous or diaphanous membrane, it loses its transparency, becomes dull, and in some instances dry. These changes may be observed not only in the pleura, pericardium and peritoneum, but in the

arachnoid membrane, in which it is distinct when other traces of inflammation cannot be recognized. At the same time, red vessels appear in isolated spots over a considerable extent. They are arborescent, and consist of minute red lines radiating from star-like points. These vessels, though placed in the substance of the membrane, gradually approach the surface as the process advances. They are not newly developed, but are the colorless capillaries of the sound part, injected with red blood. After existing for a longer or shorter time, these changes are succeeded by others, which are regarded as their effects. The first and most important of these, is the formation of a new fluid at the free and inadherent surface of the membrane.

The nature of the fluid varies according to the stage of the inflammation. In the commencement of the inflammation, the capillaries deposit in small quantities, a semi-transparent fluid, which becomes more abundant as the disease advances. It is straw-colored, of a homogeneous character, and as it is effused, undergoes spontaneous coagulation. This consists in part of the fluid attaining a solid form, like jelly, in layers of variable thickness, with a honey-comb surface, and thready filaments coalescing and quite consistent. A small quantity of a thin fluid is found in the interstices of these filaments, oozing from the surface of the coagulated portion, and lodging in the most dependent part of the cavity. This process may continue until a large amount of fluid is accumulated, or the entire product of the inflamed surface may be deficient in albumen, producing an extensive accumulation of sero-purulent fluid.

Baillie and other observers state that this fluid has been supposed to be derived immediately from the blood; but this is not correct, as it is the serous or watery portion of the morbid exudations which may be seen trickling from the surface and interstices.

The red or brown tint is derived from the blood issuing from the newly-formed capillaries. Shreds of lymph are found floating in it when the accumulation occurs in the pleural cavity. The sero-purulent is often connected with albuminous fluid, from which it is separated during the process of coagulation. It consists mostly of serous fluid, with minute granules of albuminous matter, which precipitate to the bottom, leaving a chalk-like liquid, constituting the

majority of the effused fluid in the cavity. In this fluid may be seen small particles of lymph afloat. The puriform fluid of serous membranes consists of serous fluid with small granules of opaque matter, not coagulable, and is considered as an abortive effort to produce albuminous exudation. The puriform deposit mostly occurs in the peritoneum. It is a white or cream-colored opaque fluid, and occurs mostly in chronic pleurisy and peritonitis. It has been supposed that genuine purulent matter is not formed unless there has been previous ulceration of the part. But the researches of Baillie, Black, Hunter and Millin, have amply shown that purulent fluid may either be secreted by the inflamed membrane, or from the organized layers of lymph, or from both. In the first, the fluid is secreted directly from the capillaries of the inflamed membrane. In the second, it is derived from the organized false membranes which take on the suppurative action. In the third, both sets of vessels are concerned.

Symptoms.—The patient either lies on his back diagonally, or on the diseased side with the head slightly bent forward. The voice is weak, and there is a persistent cough, with more or less expectoration of mucous or muco-purulent matter. The face is puffy, and semi-transparent; the lips tumid and livid. The pulse is habitually quick and small, and febrile attacks are frequent, and often connected with chills. In recent empyema, the diagnosis may be confounded with that of pneumonic solidification. But in empyema, vocal fremitus disappears. In hepatization of the lung, it is maintained, and frequently above the average of health.

In empyema there is no crepitant rhonchus, nor is there true tubular sniffling, metallic respiration; vocal resonance is well or weakly bronchophonic. There is dulness on percussion over the entire pleural sac, and not unfrequently effusion becomes so extensive as to force the lung towards the mediastinum and spine, compressing it in so small a bulk that it appears to be destroyed. Its vessels are crushed together; its bronchial tubes and vessels closed, and the whole organ is rendered unfit for respiration. Unless much care be taken in diagnosis, this condition may be mistaken for atrophy of the lungs. In other cases the heart and mediastinum are carried over to the right side, and the former will be found beating on the right side of the sternum between the third and fourth ribs.

A case of this kind occurred in my practice, where the effusion, following latent pleuritis, was so extensive that it not only carried the lung forward and backward towards the mediastinum, and against the spine, compressing it so completely as to prevent the ingress of air; but the heart and mediastinum were carried forward, and beneath the sternum, so as to encroach materially upon the right lung. In this case the symptoms at first were those of latent pleuritis, followed by a persistent cough, with expectoration of muco-purulent fluid, great dyspnœa, and inability to lie on the affected side. There was great dulness on percussion, which extended an inch over the right of the sternum.

The only physical signs which were diagnostic of the disease, were the absence of the respiratory murmur on the left side, the deviation of the area of dulness upon percussion on changing the position of the patient, the dyspnœa, and the increased diameter of the left half of the chest, which was three and one-half inches greater than the right. In this case, absorbents, diuretics and tonics, only gave temporary relief. In the course of two and one-half years, an opening made its appearance in the base of the pleura and diaphragm, where it had previously become attached, and the fluid escaped into the cavity of the abdomen, producing peritonitis and death. The patient refused to submit to the operation of paracentesis. Dr. Hughes reports a case of thoracic disease, where the patient became much debilitated, with quick pulse, dyspnœa, and every physical sign of effusion into the right pleura. There was no bulging of the intercostal space; but a flat fluctuating tumor was observed, which dilated upon coughing. A small trocar was introduced, and twenty-four ounces of turbid serum were drawn off. Iodide of potassium and sarsaparilla were taken, which afforded partial relief, yet he states that he operated again in two weeks, and drew off thirty-six ounces. No inconvenience followed, and the patient appeared much improved. Some two months afterward, the tapping was again repeated, and twelve ounces of fluid drawn off. In two months more his health appeared good; but there seemed to be an increase of fluid, tapping was again performed, and thirty-six ounces of fluid evacuated. He was tapped again on the eighteenth and twenty-sixth of November successively, which was also performed on the twenty-first of December.

Finding that repetition of the operation must still be continued, the patient learned to perform it himself, and actually did so twice. The prognosis was subsequently favorable, and after fifteen tappings his restoration was complete.

Treatment.—The first efforts of the physician should be to produce absorption, which can be accomplished, in most cases, when the walls of the sac are in a normal condition. But, unfortunately, in many instances the albuminous exudation forms a complete false membrane to the internal walls of the sac, which entirely precludes the action of the absorbents upon the effused fluid. In this event but little can be expected from the use of remedies, until the fluid is evacuated by means of the trocar.

The operation of paracentesis thoracis is performed in this manner. The patient should be propped up in bed, and inclined a little to the sound side, so as to separate the ribs, as much as possible, on the diseased side. The skin is to be divided to the extent of one and a half inches, in a direction parallel with the superior edge of the lower rib, on the intercostal space that is selected for the puncture. After dividing the superficial fascia, and any portion of a muscle of the chest that may intervene, as well as the external and internal intercostal muscles, the pleura will be seen to bulge into the wound. After being distinctly felt by the finger, so as to establish the fact that only fluid is behind it, a trocar, armed with a canula, should be introduced through the sac; the trocar should be withdrawn, and the canula allowed to remain until the fluid is discharged. Or the pleura may be punctured by means of a sharp-pointed bistoury. On making the incision through the integument, the skin should be drawn up from an inch to an inch and a half above the intercostal space intended for the internal opening, so that after the evacuation of the fluid, the integument, by passing down over the internal wound, may exclude the air from the pleural cavity, which is one of the most essential conditions to be observed in this operation.

If there is a probability that the fluid may be absorbed, an attempt should be made by the use of the following:—Take corydalin, ten grains; phytolaccin, two grains; iodide of potassium, thirty grains; syrup of marshmallow, three ounces. Triturate, and mix well together; give from one half to one dram three times a day.

At the same time apply the irritating plaster to the affected side, until a free discharge ensues.

The strength of the patient should be maintained by the use of porter, wine, beef tea, and such articles of food as are easily digested. When the above remedy has been used for two or three weeks, a change may be made to the following:—Take quinine, twenty grains; digitalin, two grains; acetate of potassa two drams; syrup of stillingia and syrup of iodide of iron, of each two ounces. Mix, and give one half teaspoonful three times a day. The skin should be thoroughly bathed in lye water two or three times a week, and every effort should be made to preserve the patient's strength.

If, after the above treatment, and such other remedies as seem to be indicated, the patient be not materially relieved, tapping should be resorted to at once. In performing this operation, much care is required to prevent the ingress of air into the cavity of the chest; otherwise empyema would be removed only by substituting emphysema. After the operation, a general diuretic, alterative, and tonic treatment should be pursued, for the purpose of preventing a re-accumulation of the fluid. If empyema be connected with organic disease of the lungs, or general tuberculosis, much relief may be obtained from the operation of paracentesis. Although it may not effect a cure, still it will very materially assist your constitutional treatment.

PULMONARY EMPHYSEMA.

Pulmonary emphysema is a term applied to the presence of air in the areolar or connected tissue. There are two varieties of the affection; *vesicular* emphysema, consisting in dilatation of the air-cells, and the *interlobular*, infiltration of the air into the interlobular areolar tissue.

Vesicular emphysema is attended with dyspnœa, which is aggravated upon any exertion. There are also a feeble cough, frothy expectoration, a dusky hue of the countenance, a weak voice, loss of flesh and strength, a stooping gait, a lowered temperature of the body, constipation, a weak and slow pulse, diminished respiration, and asthma.

Physical Signs.—Percussion yields an unnatural, clear resonance, while auscultation elicits subcrepitant and sibilant râles. Vesicular

emphysema may affect both lungs, or only one. The dilated cells vary in size from a millet seed to a hen's egg. They are produced by the rupture of the intervening coats, and the partial absorption of the air-cells. In order that we may clearly see the dilated cells, the emphysematous portion should be fully inflated and dried before it is cut; and during the process of drying, the inflation should be repeated, so that none of the included air can escape through the membrane. Owing to the dilatation of the air-cells, the entire surface over which blood-vessels can ramify, is lessened, and these may, consequently, undergo absorption. There is a diminution in the supply of blood; the emphysematous lung has a whitish appearance, and sometimes it is quite white. In extreme cases, the parenchyma has a piebald look, large portions of it having a bleached appearance. The lung is also drier than in health, owing to a smaller amount of capillary blood-vessels. The dilatation may affect only a few cells, or may occupy isolated spots. When only one lung is emphysematous, it is much larger than the healthy one, and may displace the heart and mediastinum.

Anatomical Characters.—Emphysema is characterized anatomically by a permanent enlargement of the air-vesicles of the lung. These may frequently be seen through the pleura, with an ordinary lens, like groups of minute pearls. Two or more of them may break into each other, and produce others of larger dimensions, say the size of a millet seed, and this process may go on, until, by the breaking down of the intervening partitions, every size of emphysematous cavity may be formed, up to that of a large orange. The walls of such cavities remain permanently open, having lost their elasticity. The tissues which form them also are evidently atrophied, and their paleness proves that the capillaries have been so compressed as to be either obliterated or impervious to the passage of blood.

In order to account for emphysema, numerous theories have been advanced, of which I shall allude to only the first and last. Laënnec supposed that the fine bronchial tubes became rigid and more or less impervious from swelling of their lining membranes, or impaction of mucus. He conceived that inspiration was a more powerful action than expiration, so that while air could be drawn through the obstructions, it could not be breathed out. In consequence, it accumulated in the ultimate pulmonary vesicles, became expanded

by heat, and so acted mechanically as a dilator, distending them from within, and causing them to enlarge more and more, according to the duration of the disease, and extent of the respiratory efforts. Dr. Gerhard, however, has pointed out that expiration is a much more powerful act than inspiration, and that there is never any difficulty in causing expulsion of air. It is the inspiration which is laborious in all cases of bronchitis, and, as has been previously stated, when the tubes are obstructed, so far are the air-cells beyond them from being dilated, that they are, in truth, collapsed. Emphysema, then, does not occur in the vesicles connected with obstructed tubes, but in those healthy ones which are adjacent. When the lungs are in a normal state, the column of air presses equally on all the tubes and vesicles; but when one portion connected with any obstruction is collapsed or otherwise diminished in bulk, then the neighboring portion is over-expanded, so as to occupy the space previously filled by the former. Hence, we see emphysema occurs not only as a result of bronchitis, but of chronic phthisis, or any other disease which causes contraction and hypertrophy of the pulmonary fibrous tissue. Dr. Jenner also says, "The atmospheric air, moved by the inspiratory effort, can exert comparatively little pressure on the inner surface of the air-cells situated at the extreme margin of the base, the root of the lower lobe, (*i. e.* that part immediately next the spine and below the primary bronchus,) or at the part of the apex situated in the furrow posterior to the trachea on the right side. While violent expiration, being chiefly performed or greatly aided by the abdominal muscles forcing upwards the liver, etc., drives the air, (in consequence of the highly arched form of the diaphragm in violent expiration,) from the central part of the lung, not only through the bronchi towards the larynx, but also towards the circumference of the lungs, *i. e.*, towards those parts which are the least compressed during expiration." This view is confirmed by all that we know of the usual seat of emphysema, and by the effects of expiration as made visible under particular circumstances.

Causes.—There are three ways by which air may make its ingress into the cellular tissue. 1. By a wound of the integument. This is termed traumatic emphysema. 2. By the development of gas

within its cells. 3. By a fistulous opening through the lung, communicating with the pleural cavity.

Diagnosis.—The diagnosis of emphysema is seldom difficult. When air accumulates in the cavity of the pleura, it will readily be distinguished from empyema, by the resonance on percussion. When it accumulates in the cellular tissue, the swelling is uniform and light, and yields a peculiar crepitant sound upon pressure, caused by the removal of the air from one cell to the other.

Prognosis.—The prognosis will depend upon the cause of the emphysema, and the state of the respiratory organs.

Treatment.—In the treatment of this disease, the object should be to arrest its progress by preventing a further accumulation of air in the cellular tissue, and to remove that already accumulated. In spontaneous emphysema, the only effectual method of arresting the disease, is to correct the morbid state of the system which gives rise to it. When it proceeds from asthenic and typhoid diseases, quinine and iron, with a liberal diet, will generally arrest its progress. By scarification, the air which has previously accumulated, will make its escape, if in the cutaneous tissue. In emphysema arising from wounds, by enlarging the wound so as to give free exit to the air, the difficulty may be relieved. When it occurs as the effect of a fistulous opening into the pleura, the inhalation of the vapor of nitrate of silver, together with astringents, will generally effect a cure. If there be tuberculous affection of the lungs or bronchia, it should be treated as directed under that head.

The asthma, associated with emphysema, may frequently be relieved by inhaling chloroform, nitrous oxide gas, or the ethereal tincture of lobelia, as recommended under the head of asthma. Various vapors have also been inhaled for the cure of the disease, but that which I have found of the greatest service, is the Mecca oil, inhaled by means of the atomizer. This should be repeated four or five times a day, and each application continue fifteen minutes.

PNEUMOTHORAX.

Pneumothorax is not, properly speaking, a disease, as it may depend upon various other affections. It may be defined as a difficulty, in which the air is confined in the pleural cavity.

It may be divided into three varieties:—That form in which the cavity of the pleura has no communication with the air; that in which the communication is through the walls of the chest; and that in which it communicates with the air through the bronchial tubes.

Symptoms.—This disease is characterized by difficult breathing, which is the most prominent symptom of the affection, the distress depending upon the quantity of air in the pleura, and on the condition of the opposite lung. If the accumulation of air be slow, the degree of pain is lessened, owing to the adaptation of the lungs to the new condition; but its most common mode of appearance in the cavity is violent, occasioning severe pains in the side, and sometimes causing discharges of pus. When there is a communication between the lung and the cavity of the pleura, there is a painful cough attending the dyspnœa. If the air should be between the lung and ribs, the sound produced by percussion is much clearer than in healthy portions of the body. If there be liquid in the cavity, it occasions a dull sound. We determine, by auscultation, the cavernous sound of the cough and voice. When the quantity of the liquid is very considerable, a peculiar sound, as of splashing is heard, especially when the patient is moved suddenly. Another sound, occasioned by coughing, resembles the noise made by the striking of a hammer. The progress of this disease varies. In some instances it proves fatal in a few hours; at other times it remains for months, or even years.

Causes.—Pneumothorax is most frequently occasioned by a tuberculous abscess of the lungs, and we very often find it in connection with phthisis. Such attacks are sudden.

The disease sometimes results from a gangrenous abscess of the lungs, and rarely from a cancerous ulceration. When there is empyema, a communication is formed from the lungs into the pleura, the pus passing into the bronchial tubes, and there released. Sometimes, instead of passing into the lungs, it proceeds along the external wall of the chest, forming a communication with the air-passages. Pneumothorax may be caused, also, by the fracture of a rib, injuring the lung; or by a forcible compression externally, causing a rupture of the pleura and air-cells. Occasionally the liquids contained in the pleural cavity decompose, and send forth

gaseous matter. Sometimes air is forced from the pleura without any apparent injury. In this disease the nature of the gas is dependent somewhat upon the cause of the affection, being sometimes extremely offensive; at others having scarcely any odor. Frequently the lung is very much displaced, but the degree of compression varies, at times being scarcely perceptible, at others the size being very much diminished. It is, in most cases, a fatal disease, although the patient may recover, even though it be connected with phthisis.

Treatment.—When called to treat a case of pneumothorax, if there be great dyspnœa, a hot sinapism should be applied to the chest, and from one-eighth to one-quarter of a grain of opium administered. The feet should be placed in hot water; and if there be pleural inflammation or irritation, asclepin and oleo-resin of lobelia should be given.

If there be extensive accumulation of air in the thorax, and it threatens immediate suffocation, it should be evacuated by means of a trocar and canula. The operation should be performed as directed under the head of empyema. It should be resorted to, however, only in cases where there is great danger. In cases where the atmosphere enters the pleural sac, through an opening made in the bronchia and section of the lung, as the result of vomica, I have known much benefit produced by inhaling the burning fumes of muriate of ammonia. When the atmosphere passes through an external opening, pads and bandages should be applied, so as to prevent the farther ingress of the atmosphere, and remedies, such as aconite, veratrum, etc., given to combat the inflammatory symptoms. When it is produced by the decomposition of fluids, the effect of pleuritis, benefit may be derived by administering one teaspoonful of carbo-ligni, in combination with small doses of anti-bilious physic and quinine, four or five times a day.

APNŒA, OR ASPHYXIA.

Apnœa, asphyxia, or loss of breath, is caused by a stoppage of the circulation through the pulmonary arteries. The supply of air being cut off, the arterialization of the blood is suspended; and as venous blood cannot enter into the pulmonary veins in sufficient quantity to maintain the contractions of the heart, the phenomena

of life are suspended. There are, however, some instances of asphyxia, in which the starting-point of the disease is in the nervous centre of respiration, the medulla oblongata, which paralyzes the respiratory muscles; thus rendering the expansion of the chest, and the entrance of fresh air into the lungs impossible.

Symptoms.—The symptoms of asphyxia vary according to the degree of the disease. There is at first a distressing feeling of retarded breathing, owing to the presence of venous blood in the pulmonary capillaries. Great anxiety is depicted on the countenance, the movements of the respiratory muscles are rapid and violent, the chest heaves, the shoulders are elevated, the alæ nasi dilated, and the patient panting or gasping for breath throws himself about convulsively, and struggles for a full, free respiratory act. When the affection is acute, the brain is implicated, and vertigo, stupor, insensibility and convulsions follow. The respiration is at this stage involuntary and irregular, and at the same time signs of non-arterialization are presented in the livid hue of the face, the prominent eyes, and the distended veins. Involuntary evacuations may occur from relaxation of the sphincters. The pulse gradually becomes weaker, but is still imperceptible. The involuntary respiratory movements cease, and the patient breathes no more. The entire surface of the body presents a livid appearance. Finally, the pulse ceases at the wrist, though the heart continues to beat feebly for a short time. Even when this organ does not pulsate, life may linger for some time.

When there is complete suspension of the pulmonary circulation, the struggle is speedily over; when, however, it is only partial, the suffering is more protracted, and the patient is tortured with excessive dyspnœa for days or weeks before sinking into complete apnœa. When the latter has been the case, the patient after recovery may suffer from inflammation of the lungs, brain, liver, kidneys, or bowels, resulting from the venous engorgements of these organs.

Causes.—Independently of those causes which impede the due aeration of the blood, there are a great many diseases, particularly of the brain and respiratory organs, in which death takes place in the pulmonary arteries. The most common causes are the inhalation of carbonic acid, nitrogen, and hydrogen; submersion of the

whole body, as in drowning, or of the face alone, as sometimes happens to the infant at birth in the maternal discharges; smothering, by the closure of the mouth and nostrils, as in the process of burking, or in the accident of being buried by the falling of loose earth; the inhalation of chloroform; in short, all non-oxygenized substances which will not support combustion, will produce apnœa. It may also be produced by large doses of opium, or other narcotics, by pressure on the brain, injuries of the spine, extreme cold, frights, electricity, convulsions, mechanical causes, as strangulation in hanging, or by solid bodies in the larynx, pharynx, or œsophagus, and in fact any thing which may interrupt the circulation of blood through the heart and lungs.

Anatomical Characters.—In apnœa, resulting from the *inhalation* of *irrespirable* gases, the sinuses of the brain, the jugulars, and all the large venous trunks, as well as the right cavities of the heart and pulmonary arteries, are found congested with dark blood, and usually in a liquid state. The pulmonary veins, left cavities of the heart, and arteries generally, are observed almost empty. In apnœa from *drowning*, the morbid appearances presented are similar to those resulting from the former cause. In addition, however, to these phenomena, there is considerable vascular congestion of the brain, and the lungs are found to contain very little water, but considerable is observed in the stomach. The anatomical characters presented by *strangulation* are a congested state of the pulmonary arteries, right cavities of the heart, brain, and the larger venous trunks generally. There are also marks of the cord around the neck, dislocation of the vertebræ, imperfect coagulation of the blood, if at all, and very little is found in the arteries, or left cavities of the heart. In persons killed by *lightning*, the heart is apt to be gorged with blood, the lungs collapsed, and in instances in which death has occurred suddenly, the blood is found in a liquid state, and the body rapidly undergoes putrefactive decomposition. When apnœa results from *cold*, the large venous trunks are gorged with blood, and though the arteries are usually comparatively empty, yet in some instances both sides of the heart are filled with imperfect coagulated blood. Most of the large viscera are in a gorged condition.

Treatment.—The treatment of asphyxia depends much upon the

cause, which should be removed as far as possible. At the same time, the body should be kept warm by means of hot flannel, frictions, etc., and the bowels should be injected with warm water, and artificial respiration produced and continued as long as the slightest prospect of resuscitation remains.

Artificial respiration may be produced by applying the mouth to one nostril, while the other is closed, at the same time making pressure on the thyroid cartilage backward and downward, so as to close the œsophagus and allow the atmospheric air to penetrate the bronchia and lungs. As soon as the lungs are filled, gentle pressure should be made upon the sides, until the air is expelled. Hot mustard pastes should be applied to the spine, and the patient exposed to a current of pure air. In case of asphyxia from drowning, Dr. Marshall's method is as follows:—

"1st. Treat the patient instantly on the spot, in the open air, freely exposing the face, neck, and chest to the breeze—except in severe weather.

"2d. In order to clear the throat, place the patient gently on the face, with one wrist under the forehead, that all fluid, and the tongue itself, may fall forward and leave the entrance into the windpipe free.

"3d. To excite respiration, turn the patient slightly on his side, and apply some irritating or stimulating agent to the nostrils, as veratria, dilute ammonia, etc.

"4th. Make the face warm by brisk friction, then dash cold water upon it.

"5th. If not successful, lose no time, but, to imitate respiration, place the patient on his face, and turn the body gently but completely on the side, and a little beyond, then, again, on the face, and so on alternately. Repeat these movements deliberately and perseveringly fifteen times only in a minute. When the patient lies on the thorax, this cavity is compressed by the weight of the body, and expiration takes place. When he is turned on the side, this pressure is removed, and inspiration occurs.

"6th. When the prone position is resumed, make a uniform and efficient pressure along the spine, removing the pressure immediately before rotation on the side. The pressure augments the

expiration; the rotation commences inspiration. Continue these measures.

"7th. Rub the limbs upward with firm pressure, and with energy, (the object being to aid the return of venous blood to the heart.)

"8th. Substitute for the patient's wet clothing, if possible, such other covering as can be instantly procured—each by-stander supplying a coat or cloak, etc. Mean time, and from time to time, to excite inspiration, let the surface of the body be slapped briskly with the hand.

"9th. Rub the body briskly till it is dry and warm, then dash cold water upon it, and repeat the rubbing.

"If the weather be very cold, and the situation exposed, it will be obvious that throughout these measures a tolerable shelter should, if possible, be secured, and in extremely cold weather it may be necessary to perform the rubbing and rotating movements with the body loosely covered with dry blankets, coats, or something of the kind."

Avoid the immediate removal of the patient, as it involves a dangerous loss of time, the use of bellows, or any forcing instrument, the warm bath, and all rough treatment.

Apnœa resulting from *strangulation*, should be treated the same as that of drowning. When resulting from the inhalation of *noxious gases*, dashing the face, breast and bowels with cold water, may sometimes prove beneficial. The bowels should at the same time be thoroughly injected with a strong infusion of capsicum, or one teaspoonful of pulverized capsicum may be added to five or six ounces of starch water, and injected into the bowels. The extremities should be thoroughly bathed with stimulating liniments, and artificial respiration, and the same general treatmemt pursued as in case of drowning.

When originating from the inhalation of chloroform, in addition to the friction, artificial respiration, volatile stimulants to the nostrils, chafing the spine, and galvanism, may be applied to the diaphragm, along the spine, and through the lungs. The treatment of asphyxia from lightning is similar to that of noxious gases, chloroform, and drowning. The treatment during convalescence should be such as will restore the general health of the patient.

PHTHISIS.

Phthisis, or pulmonary consumption, is a constitutional affection, manifesting itself in most essential changes in the pulmonary tissue. It may be acute or chronic. The acute form commences with chills, fever, rapid pulse, cough, pain, and dyspnœa, which are soon followed by night-sweats, hectic fever, great emaciation, exhaustion, and death. The chronic variety, however, is that with which we usually meet, the symptoms and progress of which will be hereafter fully detailed.

Pathology.—The general pathological doctrines relative to pulmonary phthisis have already been considered in our article on pathology. The tuberculous matter which constitutes the leading feature of pulmonary phthisis, is the specific product of an exudation occurring in the pulmonary capillaries. It is deposited in the same manner as lymph, the exudation undergoing granular degeneration, or coagulation, constituting the various forms of tuberculous deposition. Formerly, it was supposed that tuberculous matter was the result of the retrograde metamorphosis of pre-existing morbid tissues, but recent observations made by Rokitansky, Liebert, Ancell, and Hughes Bennett, demonstrate that tuberculous exudation occurs as the effect of an inflammatory process, or a peculiar condition of the pulmonary capillaries. They have also shown that this deposition may take place in other organs and tissues of the body, as well as that of the lungs, and that scrofula, tabes mesenterica, hydrocephalus, and many kindred diseases, are but the result of the morphological changes occurring in the liquor sanguinis after it escapes from the inflamed capillaries during certain conditions of the system. These conditions are those which affect primary and secondary digestion. By primary digestion, we refer to those changes occurring in the nutritive elements, essential to the conversion of the histogenetic elements into proper tissues; while, by secondary digestion, we refer to the normal function of the emunctories, and the degeneration of effete products into elements for elimination. Thus, in primary digestion, the alimentary matters are divided into nitrogenized and non-nitrogenized elements. The most important nitrogenized principles are fibrin, albumin, and casein, while the more important non-nitrogenized elements are fat, starch, gum, and

sugar. All substances, whether animal or vegetable, capable of nourishing the body, are susceptible of being converted into one or the other of these elements. The researches of Dr. Ascherson have demonstrated that both nitrogenized and non-nitrogenized elements are essential, in a certain proportion, to nutrition, and that whenever the non-nitrogenized are deficient, tuberculous degeneration occurs in the liquor sanguinis after exudation. While these elements are the types of the alimentary substances essential to nutrition, it is evident that other conditions are necessarily requisite to the perfection of the nutritive process. Thus fluid, fat, and albumen, hold in solution phosphorus, sulphur, iron, potassium, sodium, calcium, and magnesium, elements, in combination with oil and fat, as essential as the nitrogenized and non-nitrogenized properties themselves. It is the province of the stomach to extract from all nutriments these elements in definite proportions, to supply the various tissues of the system with a proper reparatory material. If the nutrition be proper, and the powers of the stomach normal, the nutritive plasma representing all these qualities will pass from the villi of the intestines, through the lacteals and blood-glands, into the general current of circulation. During their passage, the molecules and globules which constituted this fluid, are transformed into blood-corpuscles, which, upon passing through the lungs, if duly supplied with oxygen, assume all the characteristics of blood. The blood thus supplied with nutritive blastema, is constantly passing through the capillaries, yielding up its histogenetic elements, and sustaining the integrity of the various tissues. In order to maintain a healthy condition of the organs and tissues of the body, it is essential that the distribution from the blood correspond with the amount received by the digestive process on the one hand, and the waste and disintegration of the tissues on the other. It must also be borne in mind, that the blood is the receptacle of the worn-out tissues of the body, and that it is only maintained in a normal condition by the natural functions of the various organs. Thus, the liver receives from the blood a certain portion of the disintegrated elements for the formation of bile, the kidneys, others for urea, etc.; hence, while diseases may exist as the result of defective nutrition, they may also arise from imperfect transformations into the

different organs of the effete matter, which must be removed from the blood, to maintain it in a healthy condition.

Tuberculous degeneration may exist as the result of either of these conditions. Thus, if the blood is not properly supplied with nutritive elements of an albuminous and oleaginous character, in combination with a requisite proportion of earthy salts, the vitality of the system may be enfeebled, the tissue exhausted, and the blood loaded with effete matter. Upon the assumption of inflammation in any of the parenchymatous tissues, exudation of liquor sanguinis may occur and be transformed into tuberculous matter; or the normal transformations occurring in the various emunctories essential to the elimination of the effete substances from the body, being interrupted, the blood may become so contaminated as to destroy the essential nutritive elements, and the exudation may be degenerated into tuberculous granules upon the accession of inflammation.

They may exist in various forms; in fine points, gray and yellow granulations, miliary tubercles, gray or yellow tubercular masses, softened and cretaceous.

Pulmonary Granulations—Gray Granulations—Miliary Tubercles.—These various names have been used by authors to describe round, small, translucent, shining, homogeneous bodies, often not larger than a millet-seed, but varying from this to the size of a pea, which appear to form the primitive state of tubercles. Usually they are of a grayish, but oftener of a reddish or a brownish color, and in some cases they are nearly colorless. They may be isolated, or clustered in small bunches, or in aggregate masses. In the latter state they are most often found in the upper portion of the lung. But in the isolated form they are scattered sometimes thickly through the whole or greater portion of the pulmonary tissue; not unfrequently they are found situated beneath the pleura, producing an irregularity perceptible to the touch. This is oftener the case in children than adults.

Gray Tubercular Infiltration.—Laënnec defines this as the same kind of matter which forms the granules above described, deposited in the cellular tissue of the lungs in irregular masses, sometimes one, two, or even three inches in cubic dimensions without definite boundaries, or limited only by the extent of the lobules. It is hard, homogeneous, translucent, and of a grayish color, sometimes darkened

by the black matter of the lungs, portions of which become enveloped in the masses as they are formed. In some cases no traces of pulmonary tissue can be detected in the masses; in others they present remains of blood-vessels, bronchial tubes, and cellular membrane; and occasionally they are partially penetrated by the air in respiration.

Crude Tubercle and Yellow Tuberculous Infiltration.—The gray translucent matter constituting the first two deposits above noticed, appears to undergo a gradual conversion into what has usually been considered the proper tuberculous substance. In the miliary granulations, the transformation commences in a small yellowish, white spot, which most commonly appears at or near the centre, and gradually enlarges until the whole granule assumes that character.

In this altered state, the little bodies are now called *crude tubercles.* In the aggregated granules, the change commences at several points, each probably answering to a distinct granule, and considerable masses of yellow opaque matter result from the extension and ultimate coalescence of these central spots.

The same transformation takes place in the infiltrated translucent matter, beginning in like manner with isolated opaque spots, and spreading until it involves the whole deposit, which, when thus altered, receives the name of *yellow tuberculous infiltration.* This may be distinguished from the crude tubercle by an irregular and angular, instead of roundish form, and by a less regular line of division between it and the pulmonary tissue. There is no doubt that both the crude tubercle and yellow infiltration are often originally deposited in this state, without the preliminary formation of the translucent matter.

The next important change in tubercle is that of softening. See Fig. 26. This, by many authors, is said to begin in the centre, and to gradually advance to the circumference. Concerning the truth of this, there is, however, some doubt. The reasons as given by Mr. Carswell upon which such a doubt is based, are the following:—Tubercular matter is contained in the air-cells and bronchi. If, therefore, this morbid product be confined to the surface of either, or have accumulated to such a degree as to leave only a limited central portion of their cavities unoccupied, it is obvious that when

they are divided transversely, the following appearances will be observed:—A bronchial tube will resemble a tubercle having a central depression, or soft central point, owing to the centre of the bronchus not being, or never having been, occupied by the tuberculous matter, and of its containing at the same time a small quantity of mucus or other secreted fluids. 2. The air-cells will exhibit a

Fig. 26.

number of similar appearances, or rings of tuberculous matter joined together, and containing in their centres a quantity of the same kind of fluids. When the bronchi or air-cells are completely filled with tuberculous matter, no such appearances as those we have just described are observed, and hence, the reason why tubercle, in such circumstances, has been said to be still in a state of crudity, or in that state preceding the softening process.

Fig. 26. Section of a lung in the second stage of Phthisis Pulmonalis. Tubercle is extensively infiltrated in the upper lobe, and a considerable cavity has formed. *Two-thirds the real size.*

As the softening process advances, the whole tubercle becomes converted into a soft, pultaceous, yellowish mass, resembling pus. The infiltrated mass, likewise, undergoes a similar change. Sometimes the entire tuberculous deposit seems throughout its whole extent to become suddenly softened, and, in this manner, large portions of the lung are quickly destroyed. The pressure of the growing tubercle upon the circumjacent lung, at first makes it less vascular; but reaction at length takes place, inflammation succeeds,

Fig 27.

and conjestion, ulceration, and suppuration follow. In some cases, the tubercular disease passes through its various stages without giving rise to marked inflammation. In the majority of cases, however, the bronchi, air-cells, and cellular tissue, are more or less affected by the inflammatory process. The succeeding ulceration gives rise to the formation of cavities. (See Fig. 27.) Fre-

Fig. 27, shows a large cavity in the superior portion of the lung, with the deposits of large masses of tubercles on the outside of the cavity.

quently one large vomica is made up of several smaller ones, which, in the parietes of the large cavity, make excavations of irregular shape, now winding, and now crossed by bands of tissue. The size of the cavity varies from that of a pea to that of an orange. Its contents consist of a mixture of pus and bloody matter, and portions of pulmonary tissue. They may be inodorous, or fetid. In children, the vomicæ are less common than in adults. As the disease advances, a false membrane forms around the decaying tubercle, at first thin and delicate, and in appearance resembling mucous membrane. Large abscesses are sometimes seen, between which and the bronchi there is no communication.

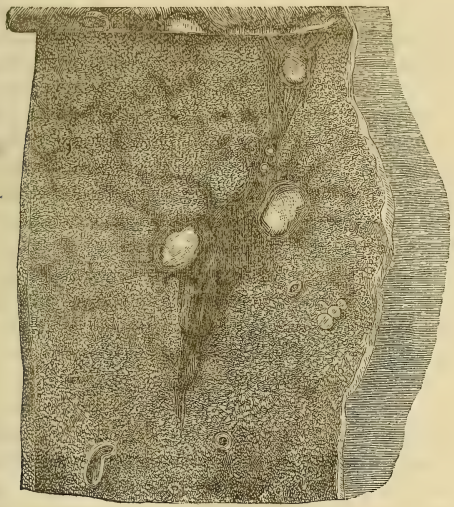


Fig. 28.

Cicatrization of Tuberculous Cavities.—Laënnec proved in his early researches into the termination of tuberculous disease, that

Fig. 28. The section of the upper portion of lung in a case seen from within, the apex having been left entire to show the deep puckerings which covered its surface. The line of the healed cavity is densely loaded with black carbonaceous deposit, in which are seen five cretaceous concretions, three of them encysted. This preparation is perhaps a unique specimen, proving the healing, by cicatrization, of an enormous tubercular excavation in the lung.

this condition is not of rare occurrence. Indeed, from this we learn that phthisis may terminate favorably when the deposit is limited in extent.

But, sometimes at the apex of the lung, we find an old adhesion, or a crust of fibro-cartilaginous deposit, or even a fibrous band passing from the lung to the ribs. Adjacent to this pathological change, the lung is puckered and drawn inward. (See Fig. 28.)

To the touch, it feels firm and consolidated; to the eye, it appears dark, from an abundant deposit of black pigment. On making an incision, we find a cavity lined by gray fibrous membrane, semi-transparent, or thick, whitish, and fibro-cartilaginous, or soft and pliable, like the mucous membrane.

In the winter of 1855, I made a post-mortem examination of a female, who had been laboring under phthisis for the last twelve years. In her case the right lung had been entirely destroyed, save a very small portion, just below the bifurcation of the bronchi, which was completely injected with tuberculous matter. This portion was about the size of a hen's egg, and completely impervious to air. A fibrous band passed from it to the lower portion of the pulmonary cavity, and was attached to the pleura costalis. The cavity was filled with sero-purulent fluid; but the woman had enjoyed a respite from the urgent symptoms of the disease, save periodical attacks of dyspnœa, in one of which she died.

Adhesions are almost always present in phthisis. In 112 cases examined by Louis, there was only one in which no adhesion was found. To some extent, their location corresponds to that of tubercles. In rare cases, the entire surface of the lung is bound down to the costal pleura, and to that of the diaphragm. These have the effect to prevent pneumo-thorax. The trachea and bronchial tubes often are the seat of extensive lesions. Those are most often affected which form a way of exit to the vomicæ. The posterior surfaces are more frequently affected than the anterior internal. The larynx and epiglottis, are sometimes the location of tuberculous disease. Among other lesions attending phthisis, are partial emphysema of the lung, dilatation of the bronchi, and enlargement of the bronchial glands. The latter is most common in children.

Appearances in Other Parts of the Body.—The origin of tubercles being in the blood, their distribution throughout the entire system

is a necessary result. But according to Louis, this general law is established, that when tuberculous deposit exists in other organs, it always occurs in the lungs. The converse of this is far from being true, and the law itself is occasionally subject to exceptions, the occurrence of which is most frequent in children. Without the lungs, the tuberculous depositions are most often composed of the yellow opaque tubercle. Gray granulations, or miliary tubercles, have also been observed in various parts of the body. From some form of tubercle, scarcely an organ of the body is wholly exempt. They are found in the liver, intestines, mesentery, prostate gland, testicles, heart, bladder, uterus, spleen, and kidneys, and in the membranes and substance of the brain. It was the conclusion of Louis, that, of all the cases of tubercles, occurring in persons over the age of fifteen years, one-third existed in the small intestines, one-fourth in the mesenteric glands, one-ninth in the large intestines, one-tenth in the cervical glands, one-twelfth in the lumbar glands, and one-fourteenth in the spleen. The stomach becomes larger than natural, thinner, and is subject to chronic inflammation of its mucous surface. The glands of Peyer, those near the cœcum, become the seat of tubercles. The mucous glands of the small intestines sometimes ulcerate, causing perforation, and the admission of the fæcal secretions into the cavities of the peritoneum. A similar diseased state of the large intestines sometimes occurs. The mesenteric glands are very much enlarged. In the brain, tubercular deposition gives rise to hydrocephalus.

General Symptoms and Course of Phthisis.—Since the discovery of the physical signs by Laënnec, the tendency of some minds has been to disregard the general symptoms in the formation of diagnosis. Among such, an unnecessary delay is often caused in the application of remedial agents; for the general symptoms very frequently are the first indications of approaching disease. A diagnosis should not then be wholly dependent upon the physical signs in the first stage; for these are seldom manifested, until the disease has so far progressed as to make a prognosis unfavorable. Certain general symptoms are grouped together, and said to be indicative of the *scrofulous diathesis*, or *tuberculous cachexia*. What this condition of the system is, or what its influence, in the development of phthisis, it may be difficult to accurately ascertain; and yet the

description of some of its more important symptoms, may be of utility in detecting that first pathological change in which phthisis commences.

Among the more important symptoms are, a pale, pasty appearance of the countenance, large upper lip and alæ nasi. In persons of dark complexion, the skin is sallow; in those of fair complexion it is unnaturally white, resembling blanched wax rather than a healthy countenance. The veins are large and conspicuous, the pupils of the eyes are large, eyelashes long, and the complexion fair and florid. In persons of a bilious temperament, the skin is coarse, and its color dingy. The form of the body is often destitute of symmetry. The trunk is small, the head large, abdomen tumid, limbs unshapely, the growth of the body irregular, and the functions of nutrition feeble and deranged. The intellect is often very active, there being great sensibility in impressions, and acuteness of mind.

Cough is one of the earliest symptoms of phthisis, and it is that which first commonly attracts the attention. In the early stages, it is slight, dry, and hacking, probably owing to irritation of the bronchi, produced by the increasing corpuscles. Sometimes it will cease for awhile, as in the summer, and recur in winter, when the external temperature is lower. In some instances, from the first it is very severe, occurring in irregular and distressing paroxysms, owing to some nervous affection. It generally, however, increases with the advance of the disease. When bronchitis is present, it becomes more and more prolonged, and hollow and reverberating when excavations exist. The *expectoration* following the dry cough is at first scanty and muco-purulent, but soon becomes copious and purulent. In the advanced forms of the disease, it consists of globular, gray, flocculent masses, which look more like little portions of wool than any thing else. When discharged in water, they sink or float as they happen to be more or less connected with mucus. When stirred or agitated, they render the water slightly milky. Along with these sputa are frequently minute portions of curdy matter. Besides this kind of expectoration, large quantities of a more liquid purulent matter, proceeding principally from the inflamed bronchia, are discharged. The quantity expectorated, in some cases, is very copious, and even exhausting; in others it is scanty.

Occasionally the distinct sputa are quite wanting, as when large caverns exist in the lungs. In this stage, the pus is occasionally streaked with blood. In some cases, after a copious discharge, it diminishes gradually. Very frequently, however, other tubercles mortify, and the discharge is renewed. In the last period of phthisis, the pus is of a reddish or brownish hue, and in it, portions of the pulmonary structure and unchanged tubercle have been observed. Both the cough and expectoration are apt to cease a few days before death, owing to the muscular debility of the patient, and that insensibility which creeps over the system, preventing impressions upon the sensorium by the matter which may exist, or be accumulating in the lungs.

Next to the cough, there is probably no symptom more constant than a *frequent pulse.* This frequently commences early, and continues steadily until the close of the disease, sometimes amounting to one hundred and thirty per minute. It is usually very much quickened by exertion. At first there is a slight irritative fever, with flushed face, and heat of hands and feet, especially towards evening. As the disease advances, the fever gradually assumes a hectic character, with a tendency to paroxysms and night sweats. The latter are frequently very distressing, giving rise to much discomfort and exhaustion, depending upon a debility of the capillaries, which allows the watery portions of the blood to pass without resistance.

Dyspnœa is not a very important symptom. It is seldom extreme until a short period before death. This is owing, in the first stage, to the very gradual progress of the tuberculous encroachment, and when the encroachment is more rapid, to the colliquative sweats and diarrhœa, which, while they exhaust the strength, proportion the circulating fluid to the decreased extent of the respiratory functions.

Neither is *pain* in the chest among the most striking phenomena. In many cases it is slight, and sometimes none is experienced. There are, however, instances in which the pains are frequent and severe, resembling those of rheumatism, and in the majority the patient is subject to those of a sharp fugitive character in the sides, or beneath the clavicles, sometimes ascribable to inflammation of the pleura, and again merely neuralgic.

Hemoptysis, one of the most important features of phthisis, some-

times ushers in the disease, but usually occurs during its course. In some instances the hemorrhage is copious, but in a greater number it is slight. There may be only one attack, or there may be a large number. The hemorrhage is probably caused by the obstruction of a portion of the lungs, which necessarily produces congestion in other parts of the organ. In the advanced stages, this congestion is relieved by the copious purulent secretion, night-sweats, and diarrhœa. Though hemoptysis is a frequent symptom, yet there are many instances in which it does not occur during the progress of the disease, unless so far as merely to stain the sputa. It is, however, among the most diagnostic symptoms; and when a patient with a chronic cough and emaciation spits blood copiously, he may with certainty be regarded as tuberculous. The affection is more frequent in women than in men, and, prior to the age of fifteen, is extremely rare, even in phthisical children.

The *appetite* is usually scarcely impaired, though occasionally cases occur in which the symptoms of dyspepsia or chronic gastritis appear to precede those of the tuberculous affection. Except as attendants upon the symptomatic fevers that sometimes occur in consumption, it is not usually until the disease is considerably advanced, that severe gastric disorders appear. Loss of appetite, heat, pain or oppression at the epigastrium, with nausea and vomiting, are then experienced. Frequently the latter is very obstinate, so that every article of food is rejected. The gastritis is owing to the unceasing fever, rather than the formation of tubercles in the mucous membrane.

Diarrhœa is a common and a very ugly symptom. It shows itself in every form, mild and severe, scanty and copious, with and without pains in the abdomen, sometimes approaching to dysentery, occasionally accompanied with hemorrhage from the bowels, and frequently indicating by the character of the stools a perverted or deficient action of the liver. It is most usually owing to tubercles in the bowels, which by their softening and discharge give rise to ulcers and inflammation. Diarrhœa does not often become urgent until the disease is far advanced. When, however, it occurs in the very commencement, it is owing to the excess of acidity in the alimentary canal, rather than to the former cause. The distress attending this symptom is often severe. Before each evacuation, the

pain is intense, and immediately after it there is a deadly sensation of sinking. The rapidity of the progress of consumption very much depends upon the diarrhœa, the loss of strength corresponding with the number of evacuations. When it is fully established, it is rarely permanently cured, although it may be arrested by medicines for a short time.

The *laryngeal* symptoms may precede the signs of tubercles in the lungs, but more frequently they occur during the course of the disease. At first, there is some hoarseness, with a feeling of dryness and huskiness of the throat, and some pain in the thorax, and the affection may terminate. But occasionally the larynx becomes ulcerated, which gives rise to loss of voice, difficulty of deglutition, the return of drinks by the nostrils upon attempts to swallow, and a most distressing and somewhat convulsive cough.

The *nervous* symptoms are comparatively very slight, considering the duration and severity of the disease. There is very little disturbance of the cerebral functions; the intellect usually remains bright until the close, unless the meninges of the brain are complicated. When no disease of the stomach or liver exists, the patient almost always evinces a cheerful and hopeful state of mind. He either believes he will recover, or is resigned to the fatal issue.

Emaciation is one of the cardinal symptoms of phthisis. Frequently it precedes the other symptoms. Indigestion is regarded as one of the principal causes of this atrophy. It is sometimes connected with anæmia. A peculiar physiognomy is often presented; the cheek is pale and thin, and the eye bright. Every organ in the body, excepting the liver and the heart, even the blood itself emaciates. At length a slight disturbance is manifested, there being a little dyspnœa, some chilliness towards evening, and a tendency to cough. This symptom is not always progressive. The patient may gain flesh, but soon lose it, then perhaps regain it, and so on alternately. However, he seldom gains as much as he loses. While there is this increase of weight, the tuberculous disease advances; and while the patient and friends are elated with hope by the apparent amendment, a fatal issue steadily approaches. When associated with disease of the stomach and bowels, the debility is greatest.

Nothing of any importance occurs in connection with the *sexual functions* in men, but in women it is otherwise. The catamenia

are very commonly suspended, increasing the danger, and the hair falls off. Pregnancy may sometimes arrest the disease for a time, and lactation exerts a favorable influence. In many instances, alarming symptoms disappear during gestation, and it frequently occurs that the disease is latent many years, owing to child-bearing and nursing, sometimes so long that the predisposition appears to be overcome. Generally, however, it returns after delivery, and takes a rapid course.

Œdema is an invariable attendant during the last stages of the disease. In young, delicate females, it may occur during the early stages. Usually it shows itself first in the lower extremities, and is confined to them. Sometimes, however, in the morning, the face assumes an œdematous appearance. This symptom is prognostic of approaching death. When œdema is present, there is great redness of the tongue, and a thrush-like exudation upon its surface, a total loss of appetite, with vomiting, diarrhœa, severe dyspnœa, extreme emaciation, and complete debility. The adipose matter is nearly all absorbed, the muscles wasted, the cheeks hollow, the eyes sunken, and the bones every where prominent, unless concealed by the œdema. Sometimes the back sloughs, owing to pressure upon the bony prominences. Until near the termination of the disease, the debility is generally not as great as might be expected, the patient being able to sit up much of the time, until a few days before death. But finally, the weakness increases so that expectoration is impossible, the cough ceases, pus accumulates, in the lungs, respiration is retarded, and death ends the scene.

Causes.—Among the predisposing causes of phthisis, that of inheritance is most influential. Although this tendency exists, yet the tuberculous disease may never be developed, if the laws of health are strictly observed, and all exciting causes avoided. Next, perhaps, in the degree of influence is a steady continuance of cold, the power of reaction becoming so exhausted, that a condition of debility exists. In fact, whatever produces permanent or long continued debility, will generate in some persons the phthisical diathesis. Hence, we may class among these causes, insufficient diet, either in quantity or quality, poverty, unwholesome air, sedentary habits, violent exercise of the chest, an habitually bent position of the body, exhausting indulgences, grief, anxiety, long watchings, copious evacuations, the abuse of mercury, etc.

Exciting Causes.—Whatever irritates or inflames the lungs, or produces in them an unusual influx of blood, or secretory product, may act as an exciting cause in persons predisposed to phthisis. The most frequent are gastric and hepatic derangements, with pulmonary or bronchial irritation. But there are various other causes, such as cool, damp apartments, the inhalation of irritating vapors or fine particles into the larynx and lungs, the suppression of long-continued morbid evacuations, the healing of old ulcers, especially fistula in ano, suppression of the menses and parturition, the retrocession of cutaneous affections, the use of tobacco, gluttony, drunkenness, self-pollution, venereal excesses, licentiousness, and other like abuses.

Various diseases also tend to develope phthisis, in those who are predisposed, as dyspepsia, measles, scarlatina, hooping cough, small-pox, typhoid fever, bronchitis, pleurisy, and pneumonia. It is much more common in women than men, occurs at an earlier period, and usually is more rapid in its progress. It originates most frequently in both sexes, between the ages of twenty and thirty. The average duration is eighteen months, although cases have been recorded which have terminated in eleven days, while others have lingered for twenty, or even forty years.

Physical Signs.—In the nascent state of phthisis, the physical signs are very equivocal. Inspection is often a valuable means of diagnosis. Prominence of the clavicles, contraction of the intercostal spaces, a flatness of the chest in front, an unequal height of the shoulders, and a depression of the ribs, when present in a tuberculous patient, indicate the presence of phthisis.

Percussion is usually somewhat dull under the clavicles. An inequality in its degree on opposite sides of the chest, and at points equally distant from the median line, adds much more significance to this physical sign, and especially if the dulness is greater on the left side. In emphysema and pneumothorax, a similar inequality of sound may exist.

In these instances the diseased side is most sonorous; but the respiration is most feeble where the resonance is greatest, a circumstance which distinguishes this condition from phthisis. An emphysematous condition of the lung occurring adjacent to the location of solidification from tubercles, may cause the percussion to remain nearly normal. Were this coincidence common, it would

certainly diminish the value of percussion in diagnosis. But it is of very rare occurrence. The signs derived from percussion should be sought about the clavicular and acromial regions. Obscurity of resonance being detected beneath one or both clavicles, or at any point of the chest near to the apices of the lungs, what conclusion should be formed as to the nature of the disease? To this question Chomel replies: "Obscurity of sound, and feeble respiration under one of the clavicles, give strong reason to suppose the existence of tubercles, for partial effusions take place in the immense majority of cases at the inferior and posterior parts of the chest, and it is almost never that chronic pneumonia is primitive, and without the presence of tubercles."

In the early stage, the slightest difference of note or pitch on opposite sides of the chest, if confined to the clavicular and acromial regions, should excite suspicion. Although the dulness may be confined to a small locality over the top of the shoulders and the scaleni muscles, yet if it be clearly perceptible, it is a very sure indication of the existence of phthisis.

Auscultation, in the *first* stage, reveals a feebleness of respiratory murmur in the sub-clavicular region. This occurs where percussion is dull, and at the same time the resonance of the voice is greater than normal. While in one part of the lung these signs are heard, in another the respiration is *blowing*. A slight difference of sound in relative situations on both sides, does not necessarily indicate phthisis. The anatomical relations of the lungs have a modifying effect. A sound in the right lung of a phthisical patient should not be considered as indicative of tubercles, unless it is decidedly blowing. But if the respiration is more blowing at the apex of the left than at that of the right lung, there can be but little doubt that tuberculous disease is present. With the advance of the disease, the respiration becomes somewhat rough, or even bronchial, with a prolongation of the expiratory sound, which is one of the most striking characteristics of tuberculous deposition. Inspiration is at times somewhat jerking. The cardiac pulsations are more audible than usual. Bronchial respiration and bronchophony are heard out of their natural locality, thus becoming indications of pulmonary lesions.

The physical signs in the *second* stage are more marked. As the

disease advances, the tubercles soften and become diluted with a morbid secretion from the pulmonary tissues. Particles of curdy or cheesy matter pass from their locality, in the parenchyma of the lungs, into the bronchial tubes, and are expectorated. The exit of this matter from the lungs gives rise to little vacuities called caverns, cavities, vomicæ, or excavations. A careful examination of the chest, at this time, affords positive evidence of the internal mischief. The upper parts are less freely raised during respiration than in the healthy state; this phenomenon frequently being more evident on one side than on the other. The sub-clavicular regions on both sides, give a dull sound on percussion. To the mind, the ear, or stethoscope, when applied to those portions of the chest situated where percussion is dull, a slight crackling noise, the crepitating râle, is revealed.

After vomicæ are formed, the cavernous râle or the gurgling is heard, when the cavity is partly filled with liquid. Resonance of the voice and cough, and at length pectoriloquy follow. If a solidified portion of lung, enclosing a considerable bronchus, come near to the surface of the chest, then bronchial breathing, and bronchophony are heard. Percussion, too, will give the same sound, whether the lung be hepatized or blocked up by tubercular matter. This condition of the lungs may be present in one part, while cavities exist in another, and, therefore, different parts of the chest will exhibit different physical signs. I have said that the gurgling sound is heard in case the vomicæ contains liquid. But does this sound necessarily prove in all cases the existence of cavities? Dr. Watson remarks, "that where we hear, during inspiration, the gurgling râle, called by Laënnec, gargouillement, we may conclude that a cavity exists. But the cavity will not necessarily be a vomica. In ninety-nine cases out of a hundred, it will be so; but in the hundredth, perhaps it will not."

Dilatation of the bronchi sometimes produces a considerable globular expansion. In case these cavities, formed by such an expansion, were filled with a liquid, the same sound would be produced as that caused by tubercular vomicæ.

The physical signs in the *third* stage are similar to those in the second. The gurgling râle, the increased resonance of voice, bronchophony, pectoriloquy, amphoric resonance, and metallic tinkling,

may be present in different cases and at different times. Some of these signs are more frequently heard than others. The metallic tinkling is oftener present in a large than in a small cavity; and since large cavities are formed in the third stage, this symptom is observed only when the disease is far advanced.

Treatment.—In the treatment of pulmonary consumption, Dr. Walshe gives the following as the result of his experience in the Brompton Hospital for consumptive patients:—"Of a given mass of patients entering the hospital in all stages of the disease, and in every variety of general condition—between the actual moribund state and that of but slight constitutional suffering—the number leaving it, on the one hand, *improved* or *unadvanced* was more than double that, on the other hand, leaving it in a worse state or dying within its walls, (the exact ratio is 67·84: 32·16.) If the cases in which death was actually imminent at the period of admission were excluded, the result would be very materially more favorable than this. 2. In 4·26 per cent. of the cases, complete restoration to health, not only as regards apparent disturbance of the functions generally, but as respects local evidence of actual pulmonary disease, was effected. 3. Complete removal of symptoms was more frequently effected in the male than in the female; but, on the other hand, the results were, on the whole, slightly more favorable in the latter than in the former sex. 4. All patients who grew worse while they were in the hospital, had reached the stage of excavation on admission; and all whose tubercles were yet unsoftened on admission, left the hospital either improved, or having had a *statu quo* condition kept up. Improvement is more probable than the reverse, even where excavation exists on admission. 5. In a given mass of cases, the chances of favorable influence from sojourn in the hospital will be greater in a certain (undetermined) ratio, as the duration of the disease previously to admission has been greater; in other terms, a natural tendency to a slow course is a more important element of success in the treatment of the disease, than the fact of that treatment having been undertaken at an early period. 6. The mean length of stay in the hospital, in the most favorable class of cases, nearly doubled that in the least favorable. 7. The chances of benefit are most in favor of those whose trades are pursued out of doors, (wholly or partially,) than of those who work wholly within.

8. The results did not appear to be influenced by the laborious or non-laborious character of the trade individuals might have pursued. 9. The age of the sufferers did not appear to exercise any very material influence on the character of the results. 10. Patients coming from the country have, on an average, a slightly stronger chance of improvement than the residents of London and its suburbs. 11. Patients admitted during the warmer half of the year, benefit by a sojourn at Brompton, to a slight extent, more than those received during the six colder months."

The above statements of Dr. Walshe confirm the observations of every careful observer in the management of pulmonary consumption, that the disease is amenable to treatment; and that, although the general practice in this affection is far from being satisfactory, yet, under nearly all systems of medicine, there are occasionally well-marked cases of pulmonary phthisis that recover.

The treatment of pulmonary consumption resolves itself into such a management of the case as will tend to prevent the development of the disease, and its removal when it exists. As we have already stated, in considering some of the pathological conditions upon which this affection depends, consumption has its origin in a vitiated and defective condition of the general organism. This may occur as the result of hereditary predisposition, or from imperfect development of either a part or the whole of the organic structure, or from defective nutrition, and disobedience to the physiological law of the general organism. Whenever this predisposition to phthisis exists, the defective organization, so far as practicable, should be remedied by a strict adherence to the laws of physiology and dietetics. Children possessing this organization should not be confined in schools, or too closely to study, but should be reared in the country, and exposed to fresh air and out-door exercise. Both boys and girls should be allowed to ramble through the fields, and indulge in all those gymnastic exercises which tend to give strength and vigor to the system generally, such as jumping the rope, rolling the hoop, flying the kite, hoeing, wheeling dirt in the garden, riding on horseback, etc. Their diet, too, should be of a simple but nutritious character, consisting of bread and milk, baked apples in milk, vegetables, and a liberal amount of meat once or twice a day. The sleeping apartments should be well

ventilated. During cold and damp seasons, they should be warmly clad. Strict attention should be paid to any out-cropping of the disease, either in the form of sore throat, enlargement of the tonsils, irregularity of the bowels, or pulmonary difficulties. They should be carefully instructed of the pernicious influences of masturbation, exposures to cold, and every other condition that tends to debilitate the system generally. In females, upon arriving at the age of puberty, the uterine functions should be carefully watched, and if there is retarded menstruation, it should be encouraged by warm sitz baths, iron, and general tonics. The young miss should be instructed that upon the appearance of the catamenia, the feet should be kept dry, washing and bathing with cold water avoided, and all exposures to cold and moisture carefully prevented.

This disease usually manifests itself in the initiatory stage, in defective digestion. Among the earliest and most alarming symptoms, are those of dyspepsia, such as constipation, flatulency, gastralgia, eructations of food, capricious appetite, and a general uneasiness or irritable condition of the system. It is in this stage that so much mischief is done by the use of drastic medicines, especially purgatives. All purgatives in phthisical cases have a tendency to debilitate the bowels, weaken the stomach, and induce imperfect nutrition. Hence, they should be avoided, and the bowels regulated by educating them to evacuations at least once in twenty-four hours, and the taking of a large draught of cold water immediately upon rising. If this practice, in connection with a well-regulated diet, should fail to remove the dyspeptic condition, one-half tea-spoonful of table salt may be dissolved in a tumblerful of cold water, and drank every morning before breakfast. A tumblerful of Saratoga water will generally answer the same purpose.

If the disease is still more marked, as characterized by an increase in the pulse, a feeling of exhaustion and general debility, with emaciation, bronchorrhœa, and a tendency to cough, in addition to a nutritious diet, fresh air, occasional baths, plenty of friction, tonics and iron should be administered.

A valuable remedy in this stage is to take alnuin, thirty grains, and hypophospite of iron, one dram, mix, and divide into twenty powders. Let one be given three times a day, immediately after

each meal. If the powers of the stomach should still be feeble, one-half grain of capsicum may be administered three or four times a day, in a wine-glassful of sweet cream.

When the disease has become still farther advanced, and there are indications of pulmonary congestion, with degeneration of the liquor sanguinis into tuberculous matter, the following compound has proved of the greatest value:—Take cod liver oil, one ounce; simple syrup four ounces; carbonate of iron, one dram; tincture of aconiti folia, one-half dram; mix, and let the patient take one teaspoonful five or six times a day. If this condition should be associated with cough, one or two grains of white mustard seed should be placed in the mouth, finely masticated, and swallowed every half hour or hour. This simple remedy has been found to control some most irritable coughs, when other remedies have failed.

When tuberculous deposition has become more extensive, and the function of respiration somewhat impaired, in addition to the above treatment, the effete matters of the system should be removed through the kidneys. This can be accomplished by allowing the patient to drink freely of a moderately mild decoction of equal parts of chimaphila umbellata, eupatorium purpureum, and anthemis nobilis. This should be drunk liberally three or four times a day. Elimination through the skin should also be encouraged, by occasional warm soda baths, followed by an abundance of friction.

Much diversity of opinion exists relative to the use of alcoholic stimulants in this disease. Dr. Tanner, in connection with a large majority of the profession, is of the opinion that a small quantity of brandy or wine, taken three or four times a day, serves a most valuable purpose. Dr. Flint remarks that out of sixty-two cases of arrested tuberculous disease that came under his own observation, fourteen were due exclusively to the use of alcoholic stimulants, and that in nine, the cure appeared to be complete. The stimulant he administered was whisky, about one pint of which was taken per day. Much stress has been put upon the change of climate, and it is more than probable that much benefit may frequently be derived from this source. This is especially the case when the patient's residence is in a moist, cold, and changeable one. A change from a hot to a cold climate has not been followed by the most favorable results. A dry and salubrious atmosphere, however,

always proves beneficial. The climate in our own country, which has been of the greatest benefit to consumptive patients, is that of Wisconsin, Minnesota, Nevada, Montana, Colorado, Utah, and California. The western coasts of Scotland, Malaga, Madeira, and Malta, have also been highly recommended for phthisical patients. Much diversity of opinion also exists, in the use of certain mineral waters. Sulphur Springs, Iron Springs, Hot Springs of Arkansas, Saratoga Springs, and many other places, have been popular resorts for consumptives, and in many instances, benefit has been derived; but we apprehend that it is principally due to the out-door exercise, bracing atmosphere, and other conditions which contribute to the improvement of the general health and to the digestive organs. More recently, patients have been in the habit of resorting to the oil regions of Eastern Ohio, Western Virginia and Western Pennsylvania, and drinking the oil-water as pumped from the wells, in connection with the oil. We have paid much attention to the influences of these waters upon this class of patients, and have found that it differed much in different localities. In the oil regions of Pennsylvania, but little benefit appears to be derived from the use of the oil water; and the same has comparatively been the case in Western Virginia, although that of the latter appears to exert more favorable results than that of Pennsylvania. As far as we are acquainted, the oil-water as pumped from the wells of Mecca, has proved of much greater benefit than that obtained from any other locality. We have sent a large number of patients in nearly every stage of tuberculous development, and in no one instance have they failed to be essentially benefited, or radically cured. In this locality, the oil is pumped from about fifty to seventy-five feet, in connection with a large amount of water. The oil and water, as pumped from the wells, appear to be thorougly mixed, the oil existing in small globules, and saturating the water. Patients are ordered to drink it immediately after being pumped. In a very short time they become very fond of it, and drink it in large quantities. It improves the appetite, promotes digestion, and vigorously excites the renal secretions, besides allaying the cough and bronchial irritations. It also possesses fattening properties, as patients invariably increase in weight, and that, too, in many instances where the

quantity of food eaten is very small. Several months' residence is usually required to produce a radical constitutional change.

In the second stage of phthisis, in which, when tuberculous softening commences, as indicated by the formation of vomicæ, and the expectoration of disintegrated tuberculous matter, a great variety of remedies has been recommended. It is in this stage that we have found the most benefit from the use of alcoholic stimulants. We have almost invariably prescribed, and with benefit, the use of light wines, such as plain Catawba, sherry, claret, port, and the sour German wine. These should be taken either at meals, or at luncheon, in liberal quantities. Porter and ale have also been beneficially used when the stomach will tolerate them. Every possible effort should be made to enrich the blood, and support the general integrity of the system. Hence, the diet should consist of milk, cream, rare-cooked eggs, oysters, and such other articles of food as are nutritious, and easily digested. All labor, and other influences that tend to debilitate the system, should be carefully avoided. Country air, cheerful company, and lively sports, prove of the greatest benefit.

Inhalations prove of great service. It must be borne in mind that this stage is characterized by a troublesome cough, accompanied by a dry and difficult expectoration. It must also be remembered that all the expectorants compounded by physicians and pharmaceutists, nauseate the stomach, and impair digestion; and although they may give temporary relief, ultimately have a most pernicious influence upon the progress of the disease. Hence, they should be proscribed in all cases. The cough, however, may be allayed by inhaling a hot vapor of stramonium, lobelia, aconite, or veratrum. The disintegration of tuberculous matter may frequently be arrested by the inhalation of the vapors of baptisia tinctoria, comptonia asplenifolia, pyroligneous acid, creasote, or Mecca oil. At the same time, the integrity of the blood may be maintained by the following compound:—Mecca oil, one ounce; cod liver oil, one ounce; hypophosphite of soda, one dram; hypophosphite of iron, one-half dram; simple syrup, four ounces. Mix, and take a teaspoonful four or four times a day in a tablespoonful of either port, Madeira, or champagne wine.

If there be chills, fever, and night-sweats, in addition to these

means, one drop of creasote, one of prussic acid, and five grains of ferro-ferricyanidum may be made into a pill, and taken at bed-time, or it may be administered in any form which would be more convenient. Two or three drops of nitro-muriatic acid, taken in a little water three or four times a day, may also arrest the chills and sweats. The greatest benefit may be derived by rubbing the chest and abdomen two or three times a day with Mecca oil, and wearing a flannel jacket next to the skin. If there be fever, and bronchitis or pneumonia associated, they should be controlled by aconite, or the tincture of corallorrhiza odontorrhiza, and hot packs.

In the *third* stage, the symptoms usually become more complicated. In addition to the emaciation, debility, chills, and fever, there are frequently diarrhœa, œdematous extremities, copious expectoration, loss of appetite; and in females, derangement of the menstrual function, which frequently amounts to dysmenorrhœa, or amenorrhœa. The urine also becomes scanty and high-colored, although, in some cases, copious evacuations of limpid urine occur. When there is dysmenorrhœa, one or two grains of senecin, and an equal quantity of carbonate of iron, should be administered two or three times a day, for a week or ten days previously to the catamenial period. At the time of the appearance of the menses, hot sitz baths should be taken once or twice a day; and if there be much pain, hot water vaginal injections. In case of amenorrhœa, in addition to the general tonic and invigorating treatment previously described, a strong gin tincture of the common blood-beets, in wine-glassful doses, at bed-time, in connection with one of Hooper's female pills, where the bowels will tolerate it, will do much to overcome the difficulty. Gossypiin, the essential tincture of macrotis racemosa, senecio gracilis, have been used with good effect. Where there is colliquative diarrhœa, it may be controlled by administering one-fourth or one-eighth of a grain of argenti nitras, in connection with large draughts of mucilage of acacia. Gum kino, catechu, geranin, tannin, and oxide of zinc, have been used in appropriate quantities for the same difficulty. I have also relieved the bowels in several cases where other remedies had failed, by using a strong decoction of the comptonia asplenifolia every night upon retiring. When the mucous membrane of the bowels has become ulcerated, muriate of hydrastia and chlorate of potash may also be

beneficially employed. When the stomach fails to digest the cod liver oil; others have been substituted, such as neat's foot, almond oil, cocoa-nut oil, Mecca oil, olive oil, and in some instances they have been tolerated, and proved highly beneficial. It will be remembered that the great benefit derived from oleaginous preparations is their power to combine with the albuminous materials of the food, and form the basis of blood-corpuscles; and that the quantity of oil required for this purpose is much less than what is usually administered in this disease. Dr. Thompson states that he frequently obtained the greatest benefit from the use of ten or fifteen drops of cod liver oil three or four times a day. I have in several cases, when the stomach would not tolerate the oil, applied it to the chest and abdomen by inunction, and found the greatest benefit. In one case, that of a lady, in the last stage of pulmonary consumption, where the stomach not only refused medicines, but also food, I applied pads of cotton to the chest and abdomen, saturated with Mecca oil. The most marked improvement followed in a few days. The expectoration was lessened, the cough ameliorated, the appetite improved, and strength and flesh regained; and although her system, finally, succumbed to the disease, yet she was much benefited by the application. Fish oil may be applied in the same way. Cod liver oil has also been used as an enema, when the stomach could not tolerate it. Diuretics are also required in this stage; and acetate of potash, essential tincture of pareira brava, and buchu, have been most beneficially used. Small doses of apocynin have also been employed to advantage.

A preparation which I have long been using, in connection with cod liver oil, and which has proved of the greatest benefit, is the following: take twelve eggs; phosphate of lime, one ounce; chloride of sodium, one-half ounce; iron per hydrogen, one dram; best French brandy, one pint; sugar, one pound; mix, shake well, and take one tablespoonful three or four times a day. When the cough is very troublesome, and the patient cannot obtain his usual rest, the following may be used: take simple syrup of stillingia, three ounces; syrup of tolu, two ounces; syrup of morphia, one ounce; tincture of gelsemin, one-half dram; mix, and let the patient take a teaspoonful at bed time. Carbonate of ammonia and iodide of potassium are remedies that have been extensively used in this dis-

ease, and we have found that in some cases, where there was extensive infiltration into the pulmonary tissues, that one grain of iodide of potassium, and two grains of carbonate of ammonia, administered two or three times a day, in a teaspoonful of cod liver oil, arrested the progress of the disease. Phosphorus is an agent that has also been highly recommended, and Dr. Churchill has experimented extensively with the compound and simple syrup of hypophosphites. These remedies, although occasionally serviceable, have not met the expectations of the profession. Much benefit, however, may frequently be derived from hypophosphite of soda, iron and potassium in combination with oil.

Hemoptysis is a symptom that manifests itself in nearly all stages of phthisis, and although frequently a troublesome and fatal one, yet in some cases may be followed by temporary relief. It can usually be controlled by administering one or two grains of hamamelin, and one or two of capsicum, in a tablespoonful of cream, every two or three hours. A teaspoonful of common salt, dissolved in a gill of water, will also arrest it. Ten or fifteen drops of the oil of erigeron, or that of turpentine, may also be given, and repeated as often as indicated. A wine-glassful of the decoction of piper angustifolium, is almost a specific for this symptom.

The inhalation of oleaginous mixtures, by means of the atomizer, has been employed by many physicians with great success. I have used the Mecca oil in this way, in upwards of one hundred cases, and in no instance has it failed to produce benefit, while in many instances a most radical and salutary change has been effected. My method is to let the patient inhale the oil by the atomizer for half an hour to an hour, once or twice a day. Many other substances have been used in the same manner.

Dr. Snow has shown, in a paper on the inhalation of various medicinal substances, that some must be inhaled by the aid of heat, such as opium, morphia, extract of stramonium, and the gum resins; others with the heated vapor, such as iodine, camphor, creasote; and a third class, at the ordinary temperature, such as hydrocyanic acid, ammonia and chlorine. Mead, in his day, recommended fumigations with the balsam in phthisical cases, and Dr. A. T. Thompson has stated that he has seen much benefit derived from them, when inhaled in spasmodic asthma, in shortening the parox-

ysms, and promoting expectoration. Dr. Snow found that ammoniacum emits a fragrant, or rather pungent odor, which can be inhaled very well by most persons. He also found inhalation of the watery extract of opium serviceable in relieving the cough; but that morphia was the most pleasant and suitable preparation for inhalation. Extract of stramonium afforded more or less relief in five or six cases of asthma.

He tried iodine in eighteen cases of consumption at Brompton Hospital; in ten of them it was continued for more than a month; and the conclusion to which he came was, that no benefit could be observed to follow its use. Oil of turpentine appeared to relieve the cough in a few cases, and likewise camphor. He used the volatile alkaloid conia, in the quantity of one minim, diluted with nine of spirit; the cough was usually relieved, and in two or three cases the breathing also. It would seem, therefore, from its volatility at the ordinary temperature, to be a remedy peculiarly suitable for inhalation, if it could be obtained more easily. Dr. Snow also found great relief in a few cases of bronchitis with difficult expectoration, from inhaling ammonia, twenty drops of the strong solution being mixed with two ounces of water in a Woulfe's bottle. Chlorine has been used for inhalation. It was introduced for this purpose in France, and there is good reason to believe that it has proved of material service in cases of chronic bronchitis, and even in some of phthisis.

With reference to its use in this latter disease, Dr. James Clark has observed: "We have tried it in many instances, and it has, in several, apparently suspended the progress of the disease." He also states that it relieved dyspnœa and cough in some cases, though in the majority it procured no amelioration. Dr. Thompson has likewise stated, that in cases of asthma, the relief it produced was very striking, and that in phthisis, he had observed the hectic symptoms abate.

Of the various remedies now mentioned, it is probable that gum resins and balsams, camphor, conia, and chlorine, are the most suitable and useful for inhalation; but it does not appear that by inhalation of opium, or morphia, very decided advantage has been gained over the ordinary mode of exhibiting them.

The vapor of tar was formerly recommended for inhalation, and

few medicines have been more used for this purpose than creasote. Sir Alexander Crichton, in 1823, strongly recommended tar vapor in consumption; but Dr. Forbes, in a report of cases in which he had tried it, published in the Medical and Physical Journal, stated that he found it injurious in this disease, though of service in some cases of chronic bronchitis. He appears, however, to have used it in cases so far advanced, that no benefit could reasonably have been expected from its employment. Creasote has now superseded the use of tar vapor, which does not, from its irritating properties, seem well suited for inhalation, though there can be very little doubt, when we consider the healing power it has in external application, that it must exert a similar effect upon the lungs, if it could be used in such a form as to obtain its beneficial influence apart from its irritating properties. Creasote is perhaps more generally used by the profession, for the purpose of inhalation, than any other remedy; and I believe that when sufficiently diluted with vapor or water, it is one of the most useful. I have found that it has a sedative influence, relieving cough and promoting expectoration, while it at the same time not unfrequently lessens the quanti- of the secretion, both in consumption and bronchitis. I have already observed that the pyrogenic bodies act upon the mucous and cutaneous surfaces; and my attention has been directed to other bodies of this class, by the fact that many of them have remarkable healing properties, when applied to ulcers and chronic cutaneous eruptions, a fact which leads me to suspect that this class of bodies may, when fully investigated, furnish a suitable remedy for promoting the healing of pulmonary ulcers, and thus supply the desideratum to which I have previously alluded. Many of the pyrogenic bodies possess such healing properties in cutaneous diseases, in a greater or less degree. From my own experience, I know that ointments, made with tar, creasote, spirit of tar, juniper tar oil, and napthalin, have such properties, and are valuable remedies in the treatment of skin disease.

The inference drawn from these facts, has led me to use for inhalation, some other pyrogenic bodies, as spirits of tar, juniper tar oil, Persian naphtha, and eleoptene. The spirit of tar possesses the healing virtues of tar without its irritating effects; so much so, that I think it might advantageously supersede the crude substance as

an external remedy. It is more readily volatilized than creasote, and when inhaled, produces generally a mild, stimulating, and often rather soothing effect upon the lungs. In some instances, however, it has appeared to increase the cough and expectoration, and it is not, therefore, suited for bronchitis, until inflammatory action has been subdued completely; or for cases of consumption, until progress has been made in arresting the disease. Without wishing to speak confidently of the remedy, I may state that it has appeared useful in some cases of the latter disease, in conjunction with other treatment. Juniper tar oil and oleum cadinum, which are valuable remedies in skin diseases, and much used on the Continent, are less volatile than spirits of tar, and less irritating when inhaled. Persian naphtha and eleoptene possess decided anæsthetic properties. The former, when inhaled along with the vapor of water, has in some instances relieved difficulty of breathing, in a very remarkable and decided manner; and this fact renders it worthy of trial in spasmodic asthma. Eleoptene has decided sedative properties. It has relieved cough and difficult breathing, and patients have slept well after using it, but it is not a pleasant remedy to inhale, and it has not unfrequently produced sickness, so that I should not recommend it to be used for this purpose.

I have used several of the essential oils for the purpose of inhalation. Many of them possess decidedly anti-spasmodic properties, and I have found that they have a remarkably strong power over difficulty of breathing, a property which renders them peculiarly suitable for relieving spasmodic asthma. The oil should be dissolved in spirit, and inhaled with the vapor of water, so as to dilute its stimulating properties. The oils of cubebs and copaiva, which are hydro-carbons, are mild in their action, and produce very little stimulating effect. The oxygenated oils which I have used, appeared to be more stimulating in their action on the air-tubes, and some of them have stronger anti-spasmodic and expectorant properties. The oils of anise and peppermint are very stimulating, and generally cause too much irritation. Oil of spearmint is milder and anti-spasmodic, relieving difficulty of breathing in asthma, and even in phthisis. Oil of fennel is also mild. The oil of origanum is moderately stimulating and expectorant. I have also used the oils of rosemary and pimento, which have similar

properties. The hydruret of benzole, which is the oil of bitter almonds deprived of its prussic acid, is very irritating, and much too stimulating for inhalation. Chloroform is a remedy which has been much used by some medical men for the purpose of inhalation, not only in asthma, but in consumption, in order to relieve irritable cough. In some cases I have dissolved the essential oils in chloroform, and used them in this way, for inhalation, their volatility being thus so much increased, that they may be given on a handkerchief, as chloroform is usually administered.

In addition to the remedies spoken of by Dr. Turnbull, carbonate of ammonia, nitrate of silver, sanguinaria, and veratrum viride, have been extensively used by different physicians, and, in some cases, to much advantage. The oil of erigeron, spoken of by Dr. Turnbull, I have used very successfully in several cases of hæmotysis, connected with phthisis, but whether it acts more efficiently in this way, than when introduced into the stomach, I am not prepared to say. If the inhalation of medicine be resorted to, the introduction of medicine into the stomach should not be neglected. We can readily conceive how ineffectual a treatment exclusively by inhalation must prove, since the well-established pathology of this disease shows the local affection of the lungs to be only one of the unhealthy products of the constitution.

MELANOSIS OF THE LUNG.

Melanosis is an uncommon disease, the pathology of which is rather uncertain. It is characterized by the deposition of black carbonaceous matter in the different tissues of the body. *Spurious* melanosis occurs in persons confined to a smoky atmosphere, or one loaded with coal dust. The ordinary pulmonary symptoms are characteristic of this affection, together with the expectoration of a black pigment. Post-mortem examination reveals black hepatization in some parts of the lung, or cavities infiltrated with a dark inky fluid, or a moist, œdematous condition of the serous tissue. These appearances must not be confounded with true melanosis.

The latter was first described and named by Laënnec in 1806. It consists in a morbid product, characterized by a black color of different degrees of intensity, moist and unorganized, and differing in form and consistence according to circumstances. The seat of

the affection is usually in the adipose and connected tissues, though it may be observed in the serous and mucous membranes, tendons, cartilages, and bones. It is observed in the liver, lungs, spleen, pancreas, brain, eyes, kidneys, lymphatic glands, mammæ, rectum, ovaries, uterus, and testes. These melanotic substances may appear in the blood, and be intermingled with scirrhous and other malignant tumors. They are sometimes thickly sprinkled over the surface, giving it a dotted appearance, *punctiform melanosis*. They usually assume the form of solid tumors, of variable size, being the largest where the reticular tissue is most loose and abundant. They may be the size of an orange, or only as large as the head of a pin. They are formed by the union of several smaller ones, giving them a lobulated appearance, while the surface of the separate minute ones is generally spherical. The areolar tissue surrounding the melanotic products, may be condensed into a kind of cyst. This variety, *tuberiform melanosis*, is the most common and conspicuous of all the forms, and occurs on most of the organs, and occasionally on serous surfaces, as the pleura and peritoneum. Sometimes, the black matter is spread in a continuous layer upon the serous membranes, *stratiform melanosis*. It may be so small in quantity, that the tissue on which it is deposited appears as if only stained by it, or be abundant, forming a distinct layer of a jelly-like consistence. It is met more frequently in the horse than the human subject. *Liquiform melanosis* is usually collected in natural or morbid cavities, and is owing to the destruction of melanotic tumors, and the effusion of their contents into serous cavities. When true melanosis is found in one tissue or organ, it is met with in others, resembling in this respect tubercle and cancer. When the tumors are divided and moist, they impart the black coloring matter, staining paper, and blacking one's fingers. The changes to which they are liable, resemble those peculiar to tuberculous matter. When subject to pressure, and the black matter is poured out in a soft consistence, the watery parts may be absorbed, and the mass become hard and firm. The pressure provokes inflammation of the surrounding tissues, which may cause the tumor to break.

True melanosis is characterized by a gradual failing of the vital powers, cachexia, a dusky, ash-colored countenance, disordered nutritive functions, weakness of the pulse, emaciation, dropsy, black mucous expectoration, and night-sweats.

Pathology.—Many writers assert that *true* melanosis is only another form of medullary cancer, modified by the presence of the black pigment. Cruveilheir says, as a ground for ranking it in this class, that it is rarely solitary. Paget remarks, that he has never seen nor read of any case of melanosis occurring in man, that might not be considered as medullary carcinoma, with black pigment. In the horse and dog, however, melanosis may occur with no cancerous characteristics. Dr. Walshe entertains a directly opposite opinion. He says that the black pigment can never even form a stroma; that the stroma of these tumors is perfectly distinct in its physical and chemical characters; that the tumors do not contain any cancerous juice; that their microscopical appearances are the same in all kinds of growth in which they occur; that they cause no local or general symptoms, when no cancerous characters exist, excepting those owing to the size and seat of the product; and that when they produce the latter, they are of the scirrhous or encephaloid form, impregnated with black pigment. Much uncertainty still prevails concerning the pathology of true melanosis; but from personal observations and careful study, I feel no hesitancy in stating that it is closely allied to carcinoma. It is quite frequent in horses, observed more especially in the gray or white. It appears also in the ox, dog, cat, rabbit, and mouse.

Melanosis is usually met with in the aged, and exhibits a general tendency to multiply itself in different parts of the system; it never occurring in a single organ or tissue.

Spurious melanosis is a very different affection from that just described. It occurs, as previously stated, in miners and colliers, and is caused by the inhalation of air loaded with small particles of coal or other carbonaceous matter. Some suppose that the change takes place only in lungs that were previously unsound, and that the disease is only the expulsion of melanotic tubercle, which had previously existed, as the black pigment does not make its appearance usually until some time has intervened after the labor in the coal mines is discontinued. Dr. Makellar states that the blood becomes unnaturally loaded with carbon, and that if any black pigment have entered the pulmonary tissues, an affinity for carbon is consequently created, so that it becomes more and more deposited, even long after the patient has ceased to inhale the impure atmosphere.

Spurious melanosis consists of three varieties, caused by the introduction of carbonaceous matter, the action of chemical agents on the blood, and the stagnation of blood. In the first variety, which occurs only in the lungs, these organs present a black or dark-brown color, the bronchial glands are darkened, and the tissue is hardened, infiltrated with black serum, and often broken down into irregular cavities.

In digestion and poisoning by acids, the extravasated blood and that contained in the gastric capillaries usually present a blackish tint. That contained in the intestinal capillaries may present a similar appearance upon the inhalation of sulphureted, hydrogen gas.

When the blood ceases to circulate in the capillaries of the digestive or respiratory organs, it coagulates, the serum and salts become absorbed, leaving a black substance, consisting of fibrin and hæmatin.

Treatment.—False or spurious melanosis, should be treated by removing the patient from the contaminated atmosphere, followed by active tonics, frequent baths, and the inhalation of oleaginous vapors, such as Mecca oil, cod liver oil, etc. If there be much irritation, and an asthmatic tendency, an occasional lobelia emetic will be found valuable. True melanosis should be treated with quinine, iron, cod liver oil, baths, out-door exercise, iodide of potassium, mercury, and arsenic. In one case of melanosis, in which all previous treatment had failed, I succeeded in arresting the progress of the disease by giving ten drops of Donovan's solution three times a day, in a tablespoonful of cod liver oil. The compound syrup of stillingia, and iodide of ammonia, have also been used in this disease with advantage. Salt water frictions, a generous diet, and country air, should also be prescribed.

CONDENSATION OF THE LUNG.

Condensation of the lung may result from pleurisy, phthisis, pneumonia, pleuritis, cancerous growths, enlarged bronchial glands, and intra-thoracic tumors. This condition is owing to collapse of the air-cells, produced by an increase in the secretion of the mucous membrane, with inability to expectorate it; or the secretion may be natural, but expelled with such great difficulty in old age and general debility, that it accumulates in some parts of the lung, and

acts like a plug. It is readily understood that this mucus, at the bifurcation of a bronchus, will act as a valve, consequently the vesicles beyond the obstruction become gradually emptied of air, and collapse.

This same condition is frequently met with in new-born infants, from congenital non-expansion of the air-cells, (*atelectasis.*) An infant presenting such a condition can scarcely suckle, remains drowsy and feeble, whimpers or cries, and is affected with jaundice, coldness of the surface, and partial dilatation of the chest. After a short time it may grow gradually stronger, or the symptoms may increase, terminating in convulsions and death.

Treatment.—The treatment depends much upon the conditions with which the disease is associated. If connected with phthisis, the treatment is already prescribed. When it occurs in children, cold baths, friction, and a lobelia emetic, may be serviceable, and when in adults, expanding the lungs by deep inspiration, or the use of an inhaler.

VARIOUS ORGANIC AFFECTIONS OF THE LUNGS.

In addition to those affections which have already been mentioned, the lungs are subject to various others. Extraneous substances entering the larynx, frequently lodge in the bronchia, occasioning much suffering, and sometimes speedy death, although cases are on record in which a number of years have elapsed before the foreign substance was extracted, and the patient relieved of the troublesome cough, occasioned by its presence.

We frequently find bony, calcareous and cartilaginous tumors, after death, in the upper portion of the lungs, in aged persons. They are generally small; hence they may be present during life for a considerable length of time, while the patient is unaware of their presence.

Serous cysts and hydatids have been known to exist in a few instances. The latter may grow to such a size as to disturb the action of the lungs. Small cysts have occasionally been expectorated, thus showing that the affection was present; but in most instances its existence is not known until after death. It may sometimes be difficult to distinguish it from pleurisy, but the following symptoms are sufficient to readily discern one from the other:—

Frequent pains in the affected parts; difficult breathing, which sometimes ends in death; dulness on percussion; a lack of constitutional symptoms; the absence of sound occasioned by breathing, etc. Should the tumor be pierced by a grooved needle, and a colorless liquid exude, mingled with small pieces of membrane, which is not rendered turbid with nitric acid or heat, it may be considered a sure test of the existence of hydatids.

We sometimes find malignant tumors in the lungs, as well as other parts of the body. The medullary and fibro-plastic diseases, are sometimes met with. They may consist of either encysted or non-encysted tumors, which appear to soften, and thereby form a cavity. They are characterized by difficult breathing, and a slight cough, which increase until they assume the form of constitutional symptoms. The breath, in this stage, is frequently very offensive. We find by auscultation and percussion, that the lungs are sometimes consolidated, and at others cavities are formed. The tumor sometimes crowds upon the blood-vessels, œsophagus, etc., causing numerous disorders. The most positive indication presented by this disease, is a similar affection in other parts of the body. Cirrhosis of the lungs is a wasting away of the cellular tissue of that organ, followed by a hard, white structure. The disease may affect the whole, or a small portion of the lung. The opposite lung, the heart, etc., are forced into the diseased portion of the thorax, the wall of which is also pressed down. The symptoms are, rapid pulse, cough, with a discharge of mucous, fetid matter, etc. By percussion, we discover a tubular, and sometimes a cracked metal sound; by auscultation, we find all the appearances of a lung solidified, and containing cavities. It may be distinguished from phthisis by the absence of hectic, by its slow advancement, its restriction to one lung, and displacement of the heart. Cirrhosis of the lung, in some respects, might be confounded with pleurisy, but may be distinguished from it by the turning inwards of the ribs, while the disturbance of the system is greater. The disease usually advances slowly, but always proceeds to a fatal termination. In some cases, instead of the purulent and other discharges from the lungs, which I have noticed, the sputa becomes loaded with dark, pigment matter; yet the symptoms are those of true pulmonary phthisis. This is owing to the degeneration of the tuberculous exudation

into pigment granules. The progress and effects of the disease are the same as those of ordinary phthisis. In some cases of pulmonary affections, the bronchial glands become involved, and are loaded with pigmentary, melanotic and tuberculous matter. They may be detected by dulness on percussion above the clavicle, and a corresponding enlargement of the lymphatics of the axillary, and other portions of the body.

DISEASES OF THE HEART.

PALPITATION.

The most common disease of the heart is fluttering or palpitation. This may be connected with various structural changes in the organ, yet it frequently exists independently of any such change. "The distinction between organic and functional disease of the heart," says Dr. Walshe, "is far from being easily made. Many of the general rules given for this purpose fail clinically. The inconstancy of functional, and the constancy of organic aliment, are strongly dwelt upon for examples. But all the subjective, and many of the objective symptoms, may disappear temporarily in cases of extensive organic disease. The existence of secondary changes, such as subcutaneous œdema, congestion of the lungs, &c., commonly proves the cardiac affection to be organic, but not always; for spanhæmia, added to nervous palpitation, may induce œdema. If exercise relieves a disturbed condition of the heart, the affection is pronounced to be dynamic only; but if spanhæmia exist, exercise may be unbearable." From these remarks, it will be perceived that, without much care, functional and organic disease of the heart are liable to be confounded. Indeed, nothing was more common than this, previously to the discovery of physical diagnosis, and their complete elucidation, by Laënnec. And now, without repeated physical examinations, even an adept in this method of diagnosis may mistake mere irregularity of rhythm for structural cardiac disease; as it is now universally admitted that palpitation, when connected with spanhæmia, will not only produce a basic systolic murmur, but a systolic sound at the mitral apex may be generated by the irregular action of the *musculi papillæ*, and even the area of dulness may

be extended temporarily, owing to the distention of the cavity of the heart with blood.

Symptoms of Dynamic Palpitation.—According to Laënnec, the first impression conveyed by the stethoscope is, that the heart is not enlarged. The sound is not heard loudly over a great extent, but this depends very much upon the thickness of the chest. Laënnec states that, in nervous palpitation of the heart, the heat of the patient is never sensibly elevated by its increased action, which is the case in organic diseases of this organ. This may be true as a general rule, but is far from being universally so, as my own professional experience has proved. Dr. Walshe states that in nervous affections of the heart, the area of dulness remains unaltered; but that distention to the right of the sternum may occur in prolonged paroxysms. He states, also, that the first sound is too loud and clear at the mitral apex, and somewhat abrupt and short. The sound is duller and less clicking than is natural at the mid-sternal base. The first sound may be loud enough to be audible, both to the patient and to the by-standers, at a distance of some inches from the chest. Reduplication of the second sound at the base is common, and a clear metallic ring, or a percordial rub, may accompany the shock at the mitral apex.

In order to form a correct diagnosis, we should recollect that the character of organic disease of the heart is to progress; that of functional, to occur at regular intervals; that active exercise almost invariably aggravates organic, but seldom increases the symptoms of functional; that the physical signs generally are soon developed, and remain permanent in organic, while they seldom exist, and when they do, they arise from chlorosis, in functional. The rational symptoms, which more frequently occur in nervous diseases of the heart than in functional, are choking in the throat, precordial anxiety, with faintness and actual syncope, or active pains simulating angina. The pulse beats with increased frequency, and there is a clammy coldness of the extremities, with a flushed face. The palpitation may continue for a few minutes, or for hours, or even days.

Treatment.—During the paroxysms, the remedies should be of such a character as to lessen their intensity, and, if possible, at the same time remove the cause. If this cannot be done, the paroxysm should be relieved, and an effort made to remove the cause after-

wards. For the purpose of relieving the paroxysm, take gelsemin, one grain; scutellarin, ten grains; cypripedin, fifteen grains; white sugar, thirty grains. Mix, triturate, divide into eight powders, and give one every hour until the paroxysm is relieved. At the same time, the feet should be bathed in warm water, and the patient avoid all mental and bodily excitement. After which, if there be spanæmia, take quinine, ten grains; iron per hydrogen, twelve grains; hydrastin, eleven grains; white sugar, thirty grains. Mix, triturate, divide into ten powders, and give one three times a day. The diet should be generous, and the following tonic should succeed the powders:—Take scutellarin, twenty grains; precipitated carbonate of iron, thirty grains; caulophyllin, one ounce; white sugar, half a pound. Mix, triturate, add to one pint of good port wine, and take one tablespoonful three times a day, before eating. The bowels should be kept in a free state by the use of leptandrin and neutralizing mixture, and the patient avoid all undue exercise.

ANGINA PECTORIS.

Angina pectoris is a disease characterized by paroxysmal pains and tenderness in the precordial region, extending to the head, shoulders, arms, and legs, and in some cases producing numbness. The pain is sudden in its onset, but is mostly of a dull character, although, in some cases, it is lancinating or tearing, producing exquisite torture and contractive suffocation. There may be slight dyspnœa or orthopnœa, with lividity of the countenance. The heart usually palpitates, the extremities become cold, the urine is passed in large quantities, and is mostly of a limpid appearance. The bowels are constipated, and, in most cases, there is more or less constitutional disturbance for some time previously to the attack. If there are cardiac murmurs in connection with the disease, there is reason to apprehend that it is connected with some organic difficulty of the heart. The disease may be a pure neuralgic affection of that organ, accompanied by hysteria and anæmia, or be of a periodic character, of miasmatic origin,—a mere masked ague—or it may depend upon some organic disease of the heart.

The first attacks occur at long intervals, and are apt to be brought on by fast walking, over eating, or violent exercise; but in confirmed cases, the periods of recurrence are more and more frequent.

The paroxysm may come on at any time, even when the patient is quiet in bed. In exquisite cases, it may be produced by any thing that slightly accelerates the circulation, as coughing, tenesmus, mental emotion, etc.

Pathology.—As organic cardiac affections are usually presented after death, it is almost certain that this affection is always associated with some important disease of the heart. In many instances, fatty degeneration of the muscular fibres of the heart has been observed. In some instances, ossification of the coronary arteries of the heart has been noticed.

Sir John Forbes collected forty-five examples of angina pectoris, in which the body was examined after death. Of this number there was organic disease of the heart, or great vessels, in thirty-nine cases, two only of the liver, and in those remaining, there was nothing morbid observed, excepting an excessive coating of adipose tissue about the heart. In the thirty-nine cases, in ten there was organic disease of the *heart* alone; in three, of the *aorta* alone; and one of the coronary arteries. In sixteen instances, there was ossification, or cartilaginous thickening of the coronary arteries, combined with other disease; and a morbid condition of the cardiac valves, in sixteen cases also. There was fatty degeneration of the heart, in twelve cases, and ossification and dilatation of the aorta in twenty-four.

Prognosis.—The prognosis of this disease, when uncomplicated with any organic cardiac lesion, may be favorable, although death may occur suddenly, from a suspension of the actions of the heart; or the paroxysms may, by frequent repetition, exhaust the patient, and thus terminate fatally.

Treatment.—In this affection, the first object should be to relieve the urgent symptoms, by placing the feet in warm water, applying a large sinapism over the cardiac region, and the administration of one drop of the tincture of aconite, and two or three of chloroform, every few minutes, until the paroxysm is relieved. Then a physical examination of the chest should be made, and if the affection be connected with organic disease of the heart, it should be treated accordingly. If associated with malarial affections, a full round of quinine and iron should be administered. In some instances, this disease may be associated with hysterical affections, in which event

uterine tonics should be liberally administered. If a pure neuralgic affection, one or two teaspoonfuls of the neuralgia mixture should be administered four or five times a day, in connection with baths, out-door exercise, and a generous diet.

SYNCOPE.

Syncope is characterized by a decrease, or temporary suspension of the action of the heart and respiration, with a loss of consciousness. It mostly occurs suddenly, but there may be premonitory symptoms, as nausea, mental confusion, impaired vision, pale and shrunken features, and a rapidly sinking pulse. When the syncope is complete, the features are collapsed, and of a ghastly appearance, the pulse is absent at the wrist, the surface cold, the respiration imperceptible, and unconsciousness exists. The heart seldom entirely ceases to beat. The ear, applied to the chest, will detect the first sound, greatly weakened. After a short time there is a second inspiration, and the color gradually re-appears, the pulse is perceptible, respiration natural, and consciousness returns. The duration of syncope is variable. It seldom continues more than a few seconds, but occasionally lasts for hours, or even days. Such are instances of apparent death, in which the system is in a sort of hybernation, in which, though the vital functions are suspended, vitality remains. Careful auscultation will, however, generally detect the first sound of the heart.

Causes.—The causes of syncope may act *directly* upon the heart, as the effects of organic disease, angina pectoris, rheumatism, gout, poisons, which operate immediately upon the circulation, particularly the antimonials, air in the blood vessels, the sedative influence of the warm bath, a stroke of lightning, etc. Those which act *indirectly* through the nervous system, are terror, sudden fright, offensive or fearful sights, violent injuries, sudden intelligence, severe pain, rich and oppressive odors, nausea, excessive hunger, the presence of indigestible matters in the stomach, cold water, drunk when the body is very warm and perspiring, the sensations excited in pregnancy by the movements of the fœtus, certain powerful poisons, as digitalis, tobacco, and hydrocyanic acid, deficiency, or loss of blood, profuse evacuations from excessive secretion, as in cholera and diarrhœa, the sudden removal of a long-continued pressure upon any portion of the body, etc.

Diagnosis.—Syncope may be confounded with apnœa and death. In apnœa, there is the same absence of consciousness, respiration, and action of the heart, but there are also signs of venous congestion, such as purple lips, swollen features, etc.; while in syncope, the countenance is pale and collapsed, and the skin generally bloodless. Attention to the cause will frequently serve to aid in the diagnosis. In cases of hysterical insensibility, in which the patient lies for days without motion or consciousness, there is a slight respiratory movement, and a distinct pulse at the wrist.

In instances of syncope that closely resemble death, there are a want of coldness of the surface, cadaveric rigidity, and an accumulation of the blood in dependent parts. But whenever there is any doubt, burial should be deferred until putrefaction commences.

Prognosis.—The prognosis in syncope is favorable, excepting in cases attended with much hemorrhage, and organic disease of the heart.

Treatment.—The treatment of syncope consists in the application of some volatile stimulant to the nostrils, such as camphor, ammonia, musk, and castor, or the dashing of cold water upon the face, chest, spine, abdomen, etc. In cases of protracted syncope, the feet should be placed in hot water, sinapisms applied to the spine, friction to the extremities, etc. After the urgent symptoms are controlled, the cause of the disease should be investigated, and, as far as practicable, removed.

PERICARDITIS.

The heart includes three distinct tissues, which may separately or conjointly be inflamed. Pericarditis consists of an inflammatory state of the external fibro-serous layer of the heart, and may occur as an acute or chronic affection.

Pathology.—The pathology of acute inflammation of the pericardium does not differ essentially in character from other serous inflammations. There may be exudation and liquid effusion, the quantity varying from a few ounces to three or four pints. Frank mentions a case in which six pounds of liquid were observed in the cavity. Occasionally it is limpid and nearly colorless, or of a red or sanguineous hue, but is usually yellowish, opalescent, and of a

milky or whey-like appearance. In advanced stages, it is seropurulent. It is largely mixed with blood in certain hemorrhagic states of the constitution. This exudation may become organized, and extensive adhesions occur between the heart and pericardium. It sometimes forms a false membrane, of a thickness varying from one to several lines. It may line the entire pericardial sac, or be confined to the cardiac, or the free surface exclusively, or it may exist in the form of separate patches. It is commonly the thickest upon the heart. By different observers, it has been thought to resemble a sponge, some kinds of coral, a honey-comb, lace-work, or the interior of a calf's stomach, as seen in tripe, and to a congeries of earth worms. Sometimes the pericardium exhibits a number of small, short-pointed papillæ, and again it is studded over with soft, roundish granulations. The pericardial sac may be obliterated from adhesion of its free surfaces; or the coalescing and uniting of patches of coagulable lymph opposite to each other, may produce its obliteration in parts, the adhesions being generally at the base in such instances. In cases occurring in enfeebled constitutions, the inflammation is apt to terminate in the formation of pus. The muscular walls of the heart are often involved in the inflammatory process, and there may be fatty degeneration of the cardiac tissue.

Causes.—Pericarditis is frequently caused by the metastasis of inflammation from other parts, as in pleuritis, pneumonia, rheumatism, phlebitis, etc. It is not unfrequently associated with Bright's disease of the kidneys, ichorhœmia, scurvy, pyæmia, or eruptive fevers, exposure to cold when in a state of perspiration, mechanical violence, violent mental emotions, over-fatigue, the use of tobacco and intoxicating liquors, the suppression of habitual evacuations, repelled cutaneous eruptions, masturbation, excessive venery, etc., may be enumerated among its exciting causes. It may also be due to some local irritation, as cancer, tubercle, tumor, etc.

The disease is more prevalent in early life than in adolescence, and is most frequent in men. It is frequently a secondary affection, being developed in the course of acute rheumatism, in which case it is distinguished as *rheumatic pericarditis.* Idiopathic pericarditis occurs rarely.

Symptoms.—An attack of pericarditis is usually ushered in with a slight chill, followed soon by febrile reaction, or it may commence

with marked faintness, or syncope. The symptoms which attend the attack, are pain, oppression, weight, or tenderness in the precordial region, palpitations, cough, hurried respiration, dyspnœa, inability to lie on the left side, occasional vomiting, painful deglutition, frequent and irregular pulse, headache, delirium, faintness amounting to syncope, anxiety, debility, restlessness, great nervous irritability, œdema of the face and extremities, and scanty and high-colored urine. These, however, are not always present, but the majority exist in a greater or less degree. *Fever* is always an accompaniment, and is attended with a frequent pulse, hot skin, coated tongue, and anorexia.

The *pulse* is an important symptom of the disease. Early in the attack, it is full and strong, with a sharp, angry beat, though it may be small and wiry. When the fever is fully established, it is quite frequent, from 110 to 120 per minute. It is very irregular, beating rapidly for a few strokes, and then slowly, or intermittent, as the disease advances, and towards the close being small, feeble, and scarcely perceptible.

Dyspnœa occurs in almost all cases. It may be a nervous symptom, connected with derangement of the par vagum, or be produced by the pain caused by the movements of the chest, and from pressure exerted by the accumulated fluid of the pericardium upon the lungs. In some instances, it is so severe, that the patient is unable to lie down, and speaking is difficult. The respiration is usually thirty in a minute. The irritation may extend to the diaphragm, causing hiccough, *sardonicus risus*, difficult deglutition, and alteration of voice.

The cough is usually dry. The palpitations occur generally in paroxysms, and are often violent, being produced by muscular exertion, strong mental excitement, etc. Cerebral difficulties, as cephalgia, disturbed sleep, frightful dreams, muscular twitchings, delirium, etc., are often manifested. The *pain* is sometimes very acute, commencing at the precordial region, shooting to the back, between the shoulders, and extending to the left shoulder, and down the arm. It is greatly aggravated by pressure, percussion, forcible stretching, lying on the left side, and coughing, and is experienced usually in the earlier stages, being diminished upon the effusion of lymph, or serum. Faintness, or syncope, is not a constant phenomena. Great unneasiness, anxiety, general prostration, and

jactitation, mark the termination of the attack. The œdematous condition of the face and extremities, is most common in the chronic form. The duration of an attack is generally from a week to ten days.

The *physical signs* are frictional sounds, the "attrition murmurs" of Dr. Hope, and valvular murmurs, dependent upon endocarditis. In the third stage, bulging of the precordial region, may be observed, and if there be extensive effusion, displacement of the apex of the heart upwards. The area of dulness will be changed, and very materially enlarged. The sound of the heart will be indistinct and muffled. If adhesion of the pericardial surface to the heart should occur, the cardiac action will be tremulous and unsteady.

Diagnosis.—The affections with which pericarditis may be confounded are endocarditis, pleuritis, pneumonia, and pleurodynia, but from all these it may easily be distinguished, by the dull or lancinating pain in the cardiac region, extending to the back and epigastrium, the irregular action of the heart, the intermittent and feeble pulse, the spasmodic dysphagia, the tendency to syncope, the inability to rest in a horizontal position, the ædematous condition of the face and extremities, and the physical signs presented.

Rheumatic pericarditis is distinguished bv the general rheumatic condition of the patient.

Prognosis.—The prognosis of uncomplicated pericarditis is usually favorable, excepting in debilitated constitutions. The danger depends much on the severity of the inflammation.

The fatality of acute pericarditis is due generally to associated diseases; in fact, the affection, *per se*, tends to recovery. Rheumatic pericarditis is not usually fatal in the early stage, excepting when accompanied with pleuritis, or pneumonia. When Bright's disease is associated with the affection, it rarely assumes a favorable issue.

In some cases of pericarditis, air or gas may enter the pericardial sac, (*pneumo-pericarditis.*) Its access may be owing to a wound of the thoracic walls, or of the æsophagus, or a fistulous communication between the lungs, or the stomach, and the pericardium. When air enters this cavity, by a wound of the chest, not developing any inflammation, it is styled *pneumo-pericardium.* This presence of air and liquid gives rise to splashing, and sometimes metallic sounds, and a tympanitic resonance.

Treatment.—The treatment of pericarditis should be commenced by an active lobelia emetic, a thorough purge, of anti-bilious physic and prodophyllin, followed by the frequent application of hot packs over the chest. As soon as these have been attended to, a sufficient quantity of the tincture of veratrum viride should be administered to control the inflammation, and lessen the action of the heart. Usually, from two to five drops of the officinal tincture administered every half hour is sufficient. Much larger doses in some cases may be required.

In idiopathic pericarditis, the above treatment will usually arrest the difficulty most promptly; but, when associated with rheumatism, colchicum, acetate of potash, cannabis sativa, macrotis racemosa, and other anti-rheumatic remedies will be required. In marsh or malarial districts, where the pericardial inflammation is influenced by miasm, much benefit will be derived from a full round of quinine and iron. When the disease is very active, and does not readily yield to the above treatment, a blister may be applied, instead of hot packs. Cupping, scarifying, and leeching, may also be of service in some rare cases.

ENDOCARDITIS.

Inflammation of the membrane lining the cavities of the heart, including its folds, valves, fibrous layer, and the chordæ tendinæ, is styled endocarditis. Anatomical characters reveal redness of the membrane, thickening, softening, and fibrinous exudation. The latter phenomenon may be found in layers, or in granulations, on any part of the membrane, but especially on the valves. The latter, in protracted cases, may assume a cartilaginous or osseous character, and thus produce permanent disease of one or more of the valves, especially of the mitral, or semi-lunar. Portions of the exudation may become detached, and circulate with the systemic blood until they are arrested in some artery where they act as a plug, and thus cut off the supply of blood to the part. Adhesions of the mitral valves to each other, and the aortic segments to the walls of the aorta, occasionally result from the inflammatory process. Bouillaud states that the valves may become gangrenous, but such cases are extremely rare. Ulceration of the valves may take place, producing perforation, or a ragged condition of the edges, which

may even extend to the chordæ tendinæ, breaking them down, and rendering them useless. The anatomical characters are generally limited to the left side of the heart, or the left ventricle and auricle, the right cavities being rarely the seat of endocardial inflammation.

Causes.—Endocarditis rarely occurs as an idiopathic affection, it generally being an accompaniment of other diseases. It is most frequently associated with acute rheumatism, being more common in this affection than pericarditis. Pleurisy, pneumonia, phlebitis, etc., are frequent coincidents. Cardiac affections, attendant upon disease of the kidneys, are supposed to be due to the presence of urea in the blood.

Among the exciting causes of endocarditis, may be mentioned, exposure to cold, mechanical violence, rupture of the valves from violent coughing, the metastasis of rheumatism, the presence of urea in the blood, masturbation, excessive sexual intercourse, gluttony, drunkenness, etc.

Symptoms.—Endocarditis commences with a feeling of anxiety about the heart, slight chills, fever, and a strong, excited pulse; but changes soon occur, and the pulse becomes small, frequent, and occasionally intermittent. When the inflammation is only of a limited extent, or when assuming a chronic form, the symptoms are much milder, and very obscure. The disease is usually attended with little pain, which is always of a dull character; but the valves soon become thickened, or coagula form, interfering with the free movement of the blood, owing to which the arterial blood is interrupted in its passage through the heart, and, consequently, arterial blood is not sufficiently supplied to the general system, and the lungs, right cavities of the heart, and nervous system, become congested. Owing to this, there are frequent faintings, or syncope, paleness or lividity of the countenance, distressing dysphagia, cough, jactitation, restlessness, anxiety, nervousness, colliquative perspiration, and dorsal decubitus; and if the disease progress, delirium, coma, or convulsions soon follow, and the sufferer dies in a state of general anemia.

The *physical signs* are increased action of the heart, dulness in the precordial region, and a grating sound accompanying the bellows murmur. This latter sound is the most valuable physical sign, and is caused by imperfection of the valves, and a roughness or partial

closure of the auriculo-ventricular, aortic, and pulmonary passages. It may be a soft bellows sound, in which case it is called the *bellows murmur*, or "*bruit de soufflet;*" or it may resemble the rasping of wood, the *rasping murmur*, or the "*bruit de rapé;*" or that of sawing wood, constituting the "*bruit de scie,*" or *sawing murmur;* or it may be similar to the tone of musical instruments, the "*bruit*" or *musical sound.* These murmurs vary according to the degree of roughness of the parts. If the murmur be systolic, and most distinct at or near the apex of the heart, accompanied with an irregular pulse, it is due to mitral regurgitation; if systolic, and clearest at the apex, and along the course of the aorta, with a small pulse, it indicates aortic obstruction. The exudation of lymph, and the deposit of fibrin at the orifice of the aorta, may occur, and give rise to an aortic murmur. When this murmur is most distinct from the centre of the sternum upwards towards the base, accompanied with a small, frequent, or jerking pulse, it indicates *aortic regurgitation;* but when heard most clearly from the fourth left intercostal space downwards to the apex, with an irregular, small pulse, it is due to *mitral obstruction.* The murmurs of acute endocarditis are arranged according to their frequency, by Dr. Walshe, in the following manner:—Aortic, obstructive, mitral regurgitation; aortic regurgitation; aortic, obstructive, and mitral regurgitation combined; and the aortic, obstructive, and regurgitant.

Diagnosis.—This affection may be confounded with pericarditis, from which it may readily be discriminated by the following: the less degree of pain, or its entire absence, the valvular murmur, a continuation of the first sound of the heart, dulness on percussion, and copious effusion.

Prognosis.—Endocarditis usually ends favorably when not complicated with any other affection. When there is a subsidence of the symptoms, and the valvular murmurs remain, there is danger of a permanent disease of the valves. The exuded lymph may, however, become gradually absorbed or dissolved in the blood, and thus a permanent cure be effected. In some instances, portions of the fibrinous deposit or exudation may be carried with the blood, and obstruct the arteries, causing a defective supply of blood to the congested vessel, which may result in ramollissement cerebelli, and hemiplegia.

Treatment.—The treatment for endocarditis is essentially the same as that of pericarditis in the commencement of the attack, with the exception that it may be necessary to administer stimulants in some cases, to prevent the strong tendency to syncope. As soon as the active symptoms are controlled, muriate and carbonate of ammonia and podophyllin should be liberally administered, for the purpose of preventing the organization of the exudation. Sinapisms may be applied over the cardiac region, and be frequently repeated; or, in case there is active inflammation, a blister should be used, followed by hot packs. It is remarkable with what readiness this disease yields to veratrin, or the tincture of veratrum viride. Strychnine is also a valuable remedy.

MYOCARDITIS.

Myocarditis, carditis, or inflammation of the substance of the heart, is mostly connected with endocarditis, or pericarditis, seldom occurring as an idiopathic disease. The walls of the left ventricle suffer more frequently than other parts of the heart.

Anatomical Characters.—Dissection may reveal softening, induration, the formation of abscesses, ulcers, aneurismal dilatation, and rupture. Softening of the entire heart, in which it presents a dark red and livid, or a pale grayish or yellowish appearance, rarely occurs. Instances, however, of partial inflammation are quite common. Induration, due to the deposition of lymph, is frequently observed, and sometimes the exudation degenerates into a cartilaginous or osseous tissue. Abscesses of the size of a bean, or hazel-nut, have been observed. Ulcers may result from the opening of these abscesses, but they more frequently commence on the internal surface. Sometimes they have completely perforated the walls of the heart, allowing the escape of blood into the peritoneal cavity, and they have been known to perforate the septum, producing cyanosis.

Symptoms.—As carditis is usually connected with pericarditis and endocarditis, its symptoms are so closely allied to these diseases, that as yet no diagnostic signs can be discriminated. The irregular and feeble pulse, which so frequently attend inflammation of the membranes of the heart, may be dependent upon carditis. The sudden fatal issue which occurs frequently in these af-

fections, may be the result of acute inflammation of the substance of the heart, the muscles losing their power of contraction.

The *physical signs* are equally obscure. Carditis, however, may be suspected when there is a frequent, irregular, intermittent and fluttering pulse, with faintness or syncope, dyspnœa, anxiety, and prostration, without the *bellows murmur*, or pericardial effusion, indicative of endocarditis and pericarditis.

Causes.—The causes of carditis are essentially the same as those of pericardial and endocardial inflammation. The muscles of the heart are occasionally affected with rheumatism, producing paralysis of the organ, and death. In such cases, the patient is suddenly seized with a sharp lancinating pain at the heart, suffocative dyspnœa, insensibility, convulsions, paralysis and death. Death may also be due to the formation of a coagulum in one of the large arteries.

Treatment.—Myocarditis should be treated in the early stages with veratrum viride, aconite, active counter-irritation, and hot packs. If a rheumatic tendency be suspected, colchicum, acetate of potash, and carbonate of ammonia, should be given in liberal quantities. After the active stage is controlled, strychnine should be used.

In one case of acute inflammation of the substance of the heart, I administered one grain of propylamin, one-eighth of a grain of podophyllin, and two grains of carbonate of ammonia, every two hours, with marked success. In cases where there were indications of considerable exudation into the substance of the heart, I have used one grain of xanthoxylin, one-fourth of a grain of podophyllin, and two grains of muriate of ammonia, every two or three hours, until moderate ptyalism was produced.

VALVULAR DISEASE OF THE HEART.

Valvular disease of the heart may involve all the valves, but is generally most frequent in the mitral and semi-lunar. It may consist of mere inflammation, or the edges of the valves may become agglutinated by the organization of the exudation, thus narrowing the passage; or valvular obstruction and adhesions may occur, or the cordiæ tendinæ be lengthened or shortened, making the orifice more or less obstructed, thus permitting regurgitation of the blood, and

causing imperfect closure of the valve and *regurgitation*. In protracted cases, the fibrous tissue of the valves may be transformed into fibro-cartilage or bone, or there may be a calcareous or steatomatous deposit beneath the serous membrane, which may terminate in inflammation, ulceration, rupture, or fissures. Sometimes they are covered with warty, fleshy, or cartilaginous vegetations or excrescences. When there is considerable dilatation of the heart, there may be atrophy of the valves.

Physical Signs.—The physical signs especially peculiar to valvular disease, are the perfect and imperfect regurgitating murmurs, the former arising from an obstruction to the circulation, and the latter from a leakage of the valves, owing to some morbid condition existing in their structure, or inflammation of the endocardium. They vary according to the character and extent of the disease. In some cases, they may be compared to the blowing of a pair of bellows, the *bellows murmur*, or the *bruit de soufflet*. This sound may be harsh, rough, cooing, whistling, or musical, constituting the *rasping* murmur, or *bruit de rape*, *sawing* murmur, or *bruit de scie*, and the musical sound or *bruit*. The bellows murmur is caused either by a change in the composition of the blood, or a clot in one of the cavities of the heart, or by obstruction to the free circulation of blood through the heart, and its great vessels. The valves are generally more diseased upon the left side of the heart. Dr. Harvey remarks that practically, in at least nineteen cases out of twenty, the questions to be determined are, whether it be the mitral or the aortic valve that is diseased, or both, and if the affection be of the nature of valvular obstruction, or of valvular insufficiency, or both. When the aortic valves are affected, the regurgitant murmur is modified by the extent of the disease, and is of a louder and more forcible character than when the mitral are diseased. Besides, the exact locality of the murmur may determine which of these valvular structures is affected.

The mitral valve may become thickened, or converted into bone; thus preventing the closure of the orifice of the auricle during systole, and allowing the blood to pass freely out during diastole. A double murmur may also be detected, systolic and diastolic; the latter, owing to the obstruction to the passage of the blood from the auricle to the ventricle, and the former, to the regurgitation of the

blood from the ventricle into the auricle. The murmur can be heard the most distinctly at the apex of the heart. The pulse is irregular, being intermittent, unequal, soft, small, or weak.

The valvular lesions, according to their frequency, are arranged in the following order:—Mitral regurgitant, aortic constrictive, aortic regurgitant, mitral constrictive, and diseases of the tricuspid and pulmonary valves.

The *semilunar valves* of the *pulmonary artery* are rarely affected. When diseased, the bellows murmur can be traced from the middle of the left edge of the sternum up towards the left clavicle, but the pulse is natural. In disease of the tricuspid valve, it is heard over the central and lower part of the sternum, extending to the epigastrium. There are turgescence, and pulsation of the jugular veins at every systole of the ventricle.

The systolic or diastolic character of a murmur can be distinguished by the pulse at the wrist. If systolic, the sound must be synchronous with the pulse; being indicative of *mitral* disease, if most audible at the apex; if diastolic, the murmur is not synchronous, and is most distinctly heard over the centre of the sternum, along the course of the aorta, indicating *aortic* disease.

Symptoms.—The symptoms of valvular diseases are a puffed face, bright eyes, congested lips, flushed cheeks of a purple hue, headache, tinnitus aurium, vertigo, syncope, impaired rest, frightful dreams, congestion of the brain, difficult respiration, varying from slight dyspinœa to severe orthopnœa, palpitation, and other nervous cardiac affections, congestion of the lungs, bronchitis, pneumonia, pulmonary hemorrhage, epistaxis, hemorrhages from the bronchial tubes and mucous membrane of the stomach, œdema, hydrothorax, ascites, dropsy, enlargement of the spleen, and disordered digestive apparatus.

As the disease advances, the cardiac affection is much aggravated; there are symptoms of great debility, nervousness, and death may occur suddenly from syncope, or gradually from the progress of the secondary affections.

Treatment.—In the treatment of valvular diseases of the heart, the first indication is to mitigate the urgent symptoms. This can usually be accomplished by administering small doses of cypripedin, lupulin, or hyoscyamin. If there be violent action of the heart,

one drop of hydrocyanic acid may be given with ten grains of cypripedin. In some cases, hot pediluvia, a mustard paste to the spine, and a large draught of composition tea, will answer the same purpose. Morphia and opium, although occasionally used, yet should be employed with the greatest caution, owing to their sedative influence over the heart. In cases where there is a sudden attack of palpitation and dyspnœa, resulting from valvular derangement, one-half dram of the compound aromatic spirits of ammonia, drunk in a wine-glass of water, will frequently afford relief. A dram of the compound spirits of lavender may be administered for the same purpose. As soon as the urgent symptoms are controlled, an attempt may be made to remove the valvular difficulty by the use of proper remedies. If it be vegetation or hypertrophy of the valves, we have found great benefit resulting from the use of collinsonin. In several marked cases of diseases of this character, we have administered two or three grains of collinsonin three or four times a day, with the most decided benefit. Where there are valvular incrustations, we have administered one or two grains of collinsonin, and two or three grains of iodide of ammonia, three or four times a day, in a teaspoonful of cod liver oil.

In cases of valvular insufficiency, cod liver oil, a generous diet, general tonics, and especially iron, should be administered. When a rheumatic affection attends the valvular difficulty, anti-rheumatic remedies should be connected with the above treatment.

Conia maculatum, belladonna, digitalis, veratrum viride, daturas, stramonium, and cannabis sativa, have also been extensively used in various combinations, to control the action of the heart. The influence of these drugs, however, can only be palliative. All violent exercise should be avoided, the stomach not over-loaded with food, and a strict hygienic and dietetic course observed.

CONGESTION OF THE HEART.

Congestion, or accumulation of blood in the cavities of the heart, may occur in consequence of fibrinous deposits interfering with the free movement of the valves. This deposit seems mostly to be a product of endocarditis, although it may arise from regurgitation during paroxysms of dyspnœa, and a sudden obstruction of the circulation through the lungs.

Symptoms.—The symptoms peculiar to this affection are orthopnœa, cough, paleness or lividity of the countenance, oppression, and great anxiety. Dropsical effusions, and anæmia or chlorosis, are frequently produced.

The *physical signs* are an extended area of dulness, irregular rhythm, and a labored impulse of the heart.

Treatment.—A mild purge of podophyllin and bi-tartrate of potassa, may usually be given with benefit at the commencement of the treatment. Sulphite of soda, iodide of potassa, and iodide of ammonia, are remedies that may be used advantageously in connection with diuretics. In some urgent cases, cupping, scarifying, and leeching, may prove beneficial. Small blisters applied over the region of the heart, and repeated occasionally, may prove serviceable in some cases. In obstinate cases, salivation may be produced as recommended under valvular diseases of the heart. Acids, such as citric, sulphuric, and nitro-muriatic, used for a considerable length of time, have proved beneficial in some cases. The patient should abstain from all animal food, stimulating drinks, and the use of tobacco. Violent exercise should also be prohibited.

ATROPHY OF THE HEART.

In valvular atrophy, says Dr. Walshe, when the cordæ tendinæ of the mitral valve are shortened, or extremely thin, they are probably purely atrophous; or the large tongue of the valve may be simply defective in size, without obvious puckering, or other evidence of past inflammation. In either case regurgitation may occur. The sigmoid and pulmonary valves may also become atrophous, causing regurgitation in the aorta and pulmonary veins; in the former producing syncope, in the latter asphyxia.

The physical signs are regurgitation with the bellows murmur. When there is atrophy of the parenchyma of the heart, the area of dulness will be diminished, and the diastole and systole will both be feeble.

The rational symptoms are pallor, coldness of the extremities, cough, irregular respiration, palpitation, precordial oppression, œdema of the extremities, and in females, irregularities of the catamenia, and hæmoptysis. It frequently terminates in dropsy

and phthisis. In old age, the valves of the heart becoming atrophied, frequently cause pulmonary apoplexy.

Simple atrophy may occur in connection with exhausting diseases, as cancer, phthisis, diabetes, etc. The whole organ diminishes in size, and may be found, upon dissection, to weigh only four or five ounces.

Treatment.—The patient should avoid all excesses, in mental and bodily exercise. The diet should consist of rich animal broth, with a liberal amount of fats and sugar. Give the following compound:—Precipitated carbonate of iron, 1 drachm; hydrastin, 2 drachms; white sugar, 3 drachms; port wine, 1 pint; water, one-half pint. Mix; dose, one tablespoonful three times a day. If there be much irregularity in the action of the heart, one grain of myricin, and one-thirtieth of a grain of veratrin, given twice or three times a day, will usually give relief. In old age, much benefit is sometimes derived from a moderate quantity of malt liquor once or twice a day.

HYPERTROPHY OF THE HEART.

Hypertrophy of the heart implies augmentation of bulk in its muscular substance, with or without contraction or dilatation of its cavities, caused by a preternatural determination of blood to the organ, or from a latent form of inflammation, or it may arise from a long-continued increase of action dependent upon nervous disease. It may exist with or without other affections of the heart. The difficulties with which it is most frequently connected are dilatation and ossification of the valves. It is said that hypertrophy occurs mostly in the ventricles, and that it is more commonly met with in the left, than the right. This may sometimes be true, yet, in my practice, it is far from being so generally; as in some thirty cases of both complicated and uncomplicated hypertrophy, the majority occurred in the auricles.

Hypertrophy may consist of three varieties, viz:—*Simple hypertrophy*, in which the muscular tissue of one or more of the cavities may become thicker and stronger than natural, without any diminution in the capacity of the chamber; or the parietes may be thickened, and the corresponding chamber abnormally enlarged, (*eccentric hypertrophy*, or *hypertrophy with dilatation*, or, as was

styled by Corvisart, *active aneurism of the heart;*) or the induration may be accompanied with a diminution in the size of the cavity, *concentric hypertrophy*. The latter form rarely occurs, excepting as a congenital malformation. Hypertrophy with dilatation is the most common form presented.

In *Simple hypertrophy*, in addition to the usual symptoms attendant upon organic disease of the heart, there is a powerful and heaving *impulse*, which is felt below the left nipple. There is a sensation of beating, which the patient ought not to have, which he can hear when resting. These pulsations are regular. The respiration is short, there is no marked dyspnœa, nor seldom any dropsy, but the arterial circulation being forced, there is a tendency to active congestion in the capillary vessels. The pulse is full and strong, the face florid, and the patient is liable to cephalalgia, epistaxis, active hemorrhage, and local inflammation. The impulse of the heart is much increased, the systole is less loud and clear, and shorter in duration, while the diastole is much prolonged. Sometimes the precordial region is obviously bulging and prominent. If to these physical signs there is added a systolic bellows murmur, and a corresponding small and feeble pulse at the wrist, we may safely conclude that there is some obstacle to the escape of the blood from the left ventricle into the aorta, which has given rise to the hypertrophy. But in this case, the morbid condition is a favorable sign, as the increased action of the ventricle compensates for the impediment which is opposed to the current of the blood. The blood would not circulate unless this hypertrophy existed, and consequently there would be a tendency to stagnation in the circulation, a faltering pulse, imperfect aeration of the blood, a livid appearance of the cheeks and lips, dyspnœa, and dropsy.

In hypertrophy of the right ventricle, the signs are almost similar to those enumerated above, excepting the shock of the heart's action will be felt at the base of the sternum, instead of between the fifth and sixth ribs, as in hypertrophy of the left side.

Simple hypertrophy of the right ventricle occurs rarely, and when it does exist, results from some actual or virtual obstacle to the current of the blood from the ventricle into the lungs. Dr. Watson mentions a case which occurred in a boy, who died at the age of seventeen, who had been affected for years with the *morbus*

cæruleus, as it has been styled. The heart was malformed, the septum between the ventricles imperfect at its upper part, the aorta belonged as much to one ventricle as to the other, the muscular parietes of the right ventricle were as thick as the left, and the pulmonary artery would not admit a goose-quill.

Eccentric hypertrophy, or hypertrophy with dilatation, may affect the chambers of the heart conjointly or separately. In this form the impulse is not only powerful and heaving, but is diffused over the entire precordial region, and the normal sounds of the heart are increased. This form is by far the most frequent variety of cardiac enlargement. The bulk may become three or four times greater than the average weight of the organ. The average weight of hypertrophied hearts is about fifteen ounces. The heaviest hearts ever observed were by Drs. Hope, Peacock, and Clendenning, who examined specimens weighing forty ounces.

When the entire heart is affected, it assumes a somewhat globular appearance, the apex being almost obliterated, and situated transversely in the chest. When only one side is greatly enlarged, the sound one appears like a mere appendage to the abnormal one. The fleshy columns may be stretched out and attenuated, or thickened. The orifices of the valves expand with the cavities, and the valves themselves generally increase in magnitude, so as to close the orifice, and support the increased pressure; but if the dilatation be very extensive, the valves may be imperfect, and regurgitation follow. The diseases produced by these cardiac derangements, are dropsy, hemoptyisis, asthma, tubercles, phthisis, and asphyxia.

In order to decide upon the existence of hypertrophy, it is necessary that we should be acquainted with the dimensions of the healthy heart. The size of the heart varies with the period of life, growing with the growth of the body, and continues to enlarge after maturity, even to adolescence, at least so far as the left ventricle is concerned. Laënnec roughly estimates the size of the heart to be about that of the clenched hand. According to Clendenning, Bouillard, Bizot, Cruveilhier, Pennock, and others, the average weight in the adult male is nine ounces, while that of the female is eight. The thickness of the left ventricle, at the base, is about six or seven lines, and the right two or three, the left auricle one

and a half lines, and the right, one. The ventricular walls are usually thickest near the base, diminishing gradually towards the apex.

Diagnosis.—Simple, or eccentric hypertrophy, may be distinguished from simple dilatation, by careful attention to all the symptoms and physical signs. In the former, the sounds are nearly natural, and there is a powerful, heaving impulse, while in the latter the impulse is weak, and the sounds morbidly increased.

Hypertrophy occurs in strong, robust constitutions, the latter, in anæmic, weak, and enfeebled patients.

Treatment.—Stimulating animal food, alcoholic drinks and tobacco, should be prohibited. The bowels should be kept open by means of small doses of podophyllin and muriate of ammonia; and the patient put upon the following compound: Take syrupi ferri iodidi, two ounces; compound syrup of stillingia, four ounces; mix, and give a teaspoonful four or five times a day. Five or ten drops of the tincture of veratrum viride may be administered at bedtime, for the purpose of lessening the action of the heart. After this remedy has been used for a few weeks, the following may be given: Take syrup of chimaphila umbellata, two ounces; fluid extract of cannabis sativa, one ounce; dyspeptic mixture, two ounces; mix, and give a teaspoonful four times a day. At the same time, administer a podophyllin granule every other night, upon retiring. The irritating plaster applied over the heart, continued until a free discharge ensues, may also prove serviceable. Baths, out-door exercise, and the absence of excitement, will also aid much to relieve the difficulty. A teaspoonful of Mecca oil, administered three or four times a day, has succeeded in relieving some cases, in which other remedies had failed.

DILATATION OF THE HEART.

Dilatation, or enlargement of the cavities of the heart, may be confined to one, or extend to all. There may be hypertrophy with dilatation, (*active aneurism of the heart, or eccentric hypertrophy,*) as described in our previous article; *simple dilatation*, where there is normal thickness of the walls; and *passive, or attenuated dilatation*, where the walls are simply distended, or stretched out, without any addition of substance. The latter form is often associated

with malnutrition of the heart, and fatty degeneration of the muscular fibres. Both ventricles are usually affected, and the attenuation may be so great as to produce collapse of the walls.

Causes.—The cause of this disease is ascribed by Dr. Bertin to some obstruction in the circulation of the blood, as valvular disease, etc., while Laënnec attributes it to a congenital disproportion in the parts of the heart. A more common cause, however, of the disease in this country, is an impoverished state of the blood, producing a weak and lax state of the muscles. It may also be due to some exhausting disease, or to endocarditis, or pericardial adhesion.

Symptoms.—The patient is frequently attacked with violent dyspnœa and palpitation, followed by a small, weak, and perhaps irregular pulse, coldness, and slight lividity of the extremities, giddiness, derangement of the digestive apparatus, faintness, nausea, vomiting, restlessness, constipation, asthmatic paroxysms, pain upon precordial pressure, syncope and anasarca, followed by ascites. According to Laënnec, the most constant and characteristic sign of this disease is a swollen state of the jugular veins without pulsation.

Physical Signs.—The physical signs are: increased dulness in the precordial region, irregular action of the heart, and re-duplication of the cardiac murmurs.

Treatment.—In the treatment of dilatation of the heart, every effort should be made to enrich the blood, and impart tone and vigor to the organ generally. This can best be accomplished by out-door exercise, baths, cod liver oil, iron, general tonics, a moderate use of alcoholic stimulants, especially wines, and a nourishing diet, such as fresh beef, rare-cooked eggs, and such other articles of food as are nourishing and easily digested. Alnuin, taken in grain doses two or three times a day before meals, has a tendency to increase the appetite and the powers of the stomach, so that when the stomach is feeble, much more food may be taken, and properly digested, by using it. The following mixture has been most extensively used, and with the happiest effect, to enrich the blood. Take fluid extract of alnus rubra one ounce, simple syrup four ounces, chloride of sodium, phosphate of lime, carbonate of iron, and sulphur, of each one drachm. Mix, and let a teaspoonful be taken four or five times a day.

INDURATION OF THE HEART.

The muscular tissue of the heart sometimes becomes simply indurated or hardened, without undergoing any perceptible change. Laënnec, Hope and Corvisart have described cases in which the heart gave, when struck, a sound similar to that of a dice box. When cut, it may produce a crepitant murmur. Broussais observed it, in some instances, to resemble a cocoa-nut in hardness. This affection is extremely uncommon, and is generally referred by pathologists to the process of inflammation, although its cause is veiled in obscurity.

Treatment.—It is probable that little more can be done in this affection than that recommended under cardiac inflammation. Mineral acids, ammonia, podophyllin, and iodide of potassium may be used to advantage in some cases.

FATTY DEGENERATION AND SOFTENING OF THE HEART.

Fatty degeneration of the heart may occupy the entire organ, or be limited to its walls, or even to circumscribed patches. The latter is situated at the exterior, and gives it a mottled appearance. When it is generally involved, it is flabby or flaccid, and in extreme cases, collapses when emptied or cut. Upon dissection, the interior of the ventricles are observed to be covered with buff-colored spots of a singular zigzag form. This appearance may be noticed beneath the pericardium, and pervading the whole thickness of the ventricular walls, and those of the columnæ carneæ in extreme cases. Upon microscopical examination, these spots are found to be degenerated muscular fibres, and a congeries of oil-globules, are observed in abundance within the sarcolemma, supplying the deficiency or absence of the transverse striæ.

Fatty degeneration is often associated with other morbid conditions of the heart, as obesity, dilatation, rupture, and aneurism. It may be connected with fatty disease of other organs, as the kidneys, liver, cornea, etc. When it exists alone, its presence is not frequently suspected until after death, and after a microscopical examination of some of the muscular fibres of the heart. Disease

of the valves is rarely associated with it, but when it does co-exist, the aortic valves are more generally affected than the mitral.

Symptoms.—The most prominent symptoms of fatty degeneration are a feeble action of the heart, a remarkably slow pulse, general debility, attacks of giddiness, or faintness, nervous prostration, loss of tone, etc. The cardiac sounds are weakened, while in advanced stages there are attacks of dyspnœa, with many of the symptoms peculiar to angina pectoris. The presence of the *arcus senilis* shows a constitutional tendency to fatty change, and may facilitate the forming of the diagnosis.

This lesion occurs more frequently in men than women. It may take place during any period of life, although it generally happens at maturity. It occurs especially in persons of sedentary, or indolent habits. The habitual use of alcoholic liquors predisposes to it.

It may exist for a long time, but is apt to suddenly terminate the sufferer's life, upon the occurrence of other diseases, surgical operations, etc. When it exists to any great extent, it may involve a liability to sudden death from rupture of the ventricular walls, occurring generally near the apex in the left ventricle. When sudden death occurs without rupture, it may be attributed to over-accumulation of blood within the cavities, and consequent paralysis of the muscular walls, from distention.

Sometimes the adipose tissue is increased on or among the muscular fibres of the heart, constituting more of a *fatty growth* than fatty degeneration. This may occur alone, or be associated with general obesity. The arcus senilis is a more frequent attendant in cases of fatty growth. When it exists as an independent affection, the symptoms are enlargement of the heart, and interference in the performance of its functions. The pulse is quickened and weakened.

Softening of the muscular parietes of the heart may occur with fatty degeneration or any other change, in the course of miasmatic and eruptive fevers, pyæmia, scurvy, and other affections. Louis has directed attention especially to its existence in typhoid and typhus fevers.

Treatment.—The treatment consists in changing the constitutional diathesis as much as possible, by revolutionizing the habits. The

cause should be removed, and the patient placed upon hypophosphite of iron, lime and cod liver oil. One ounce of the tonic tea, two drams of carbonate of iron, added to one quart of port wine, and one wineglassful taken three times a day, after each meal, will prove beneficial. In a few cases of fatty degeneration, I have found much benefit from the following compound:—Take fluid extract of nux vomica, one dram; diluted hydrocyanic acid, thirty drops; simple syrup of stillingia, two ounces; mix; dose, one teaspoonful three or four times a day.

When the fatty degeneration is associated with a scrofulous or tuberculous constitution, sulphuric acid, in two or three drop doses, three or four times a day, in combination with cod liver oil, and vegetable tonics, will prove of the greatest benefit. Congress water and Mecca oil water, when drunk liberally for a considerable length of time, have almost always proved beneficial in quite a number of cases.

ABNORMAL PRODUCTS OF THE HEART.

Tubercles, cysts, hydatids, and *carcinomatous disease,* are rarely observed in the heart. These affections scarcely ever attack the heart, unless they have previously existed in other parts of the system. The scirrhous variety of cancer has been said to occasion acute lancinating pains in the cardiac region. There are no diagnostic signs by which cysts and hydatids can be observed during life, but upon dissection they are occasionally found.

Fibrous, cartilaginous and *osseous transformations* have been observed in some rare instances, in the muscular tissue. Isolated calculous masses have sometimes been imbedded in the cardiac walls.

Fibrinous coagula and *polypous concretions* may be found in the cavities of the heart. The former consist of coagulated fibrin, separated from the mass of blood, of a whitish, or yellowish white color, translucent, a jelly-like consistence, and having a nucleus in the centre. They may slightly adhere to the surface of the cavity, from which they can easily be separated, without altering the structure of the endocardium. They probably result from an excess or coagulability of fibrin, which is produced by an organization of the lymph during exudation. They are usually found in the right auricle and ventricle.

Polypous concretions give rise to no very serious symptoms. They are firmer than the preceding, more opaque, of a fibrous texture, and may be composed of successive layers. In some instances they are exceedingly minute, while in others they almost fill one or more of the cavities. Their color is usually white, but occasionally red, from the presence of blood. They firmly adhere to the endocardium, and, when detached from it, give it a torn appearance. Occasionally, a vascular communication seems to exist between them and the substance of the heart.

They may be the result of fibrinous exudation from inflammation of the inner cardiac surface, or the coagulation of a portion of the blood, which afterwards contracts adhesion with the heart

These concretions prove sources of great inconvenience, and often danger, no matter how formed. They cause a diminution in the cavity in which they are found, thus narrowing the orifice through which the blood passes, or preventing a proper coaptation of the valves, which may produce most serious valvular disease.

Symptoms.—The symptoms of polypous concretions in the cavities of the heart are uncertain. They may, however, be suspected, when the action of the heart suddenly becomes embarrassed, with irregular and confused pulsations, great dyspnœa, and the usual signs dependent upon imperfect arterialization of the blood. The most frequent symptoms are a feeble, irregular pulse, paleness of face, coldness of the surface, great anxiety, prostration, suffocative dyspnœa, and inability to assume the horizontal position. Nausea and vomiting may occasionally attend the affections.

Treatment.—It is probable that little more can be done in these cases than to afford temporary relief. When the symptoms manifest themselves suddenly, in a violent form, one dram of the aromatic spirits of ammonia, administered in a little water, may afford relief. Other stimulants, as brandy, whisky, etc., may be serviceable in some cases. These diseases are so frequently confounded with inflammation, and other difficulties, that as yet there is no systematic course of medication recommended excepting such as is calculated to relieve the prominent symptoms as they are manifested.

CYANOSIS.

Cyanosis, Morbus Cæruleus, Blue Skin Disease, or *Malformation of the Heart*, a disease confined to infants, is characterized by a peculiar livid or blue appearance of the skin, extending frequently to the mucous membrane of the mouth. This discoloration varies much in degree in different cases, being sometimes slightly livid, or so dark as to approach to blackness, the intensity of the color being generally increased by whatever increases the action of the heart. Connected with this discoloration, there is a coolness of the surface, and the patient is attacked with a constant cough, dyspnœa, and palpitation. An irregular or intermittent pulse, fainting, bronchial hemorrhage, bronchorrhœa, convulsions, and dropsical effusions, are occasional attendants. The nails often become incurvated, and the tips of the toes and fingers bulbous. The generative organs are frequently malformed. When the patient is subject to violent paroxysms of palpitation and dyspnœa, they are induced by over-physical exertion, mental emotion, etc., and are apt to terminate in syncope and death. The principal malformations of the heart are shown in the following table:—

In 22	cases,	the aorta was found to arise from both ventricles.
" 30	"	the foramen ovale was open.
" 14	"	the ductus arteriosus was open.
" 4	"	a single heart with one auricle and ventricle.
" 5	"	the ventricular septum was imperfect.
" 22	"	the pulmonary artery was contracted.
" 5	"	the pulmonary artery was obliterated.
" 1	"	the aorta was obliterated.
" 4	"	the aorta arose from the right ventricle.

The above table shows that this disease is mostly dependent upon congenital deformity of the heart, and its appendages.

Treatment.—But little more can be done in the treatment of this disease, than to give temporary relief. Where there is syncope, the child should be placed in a warm bath, and ammonia or camphor applied to its nostrils; after which it should be wiped dry, and wrapped in a warm flannel. When the breast milk does not appear adequate to nourish the child, from twenty to thirty drops of cod liver oil should be administered three or four times a day. The

utmost care should be taken to give the child fresh air, and to keep its bowels open.

For the cough, one or two drops of the tincture of lobelia should be given in a teaspoonful of breast milk. The action of the heart may be regulated by aconite; and in some cases, where the deformity is only partial, the child will gradually recover.

RUPTURE OF THE HEART.

Rupture of the heart may occur as the result of some previous disease, as fatty degeneration; or it may be caused by external violence, as a heavy blow, a crushing fall, the pressure of some great weight, etc. When occurring from disease, it is more frequent on the right side; whereas, when it happens from mechanical violence, the reverse is the case. The ventricles are the most frequent seat of the laceration. Rupture of the muscular parietes of the heart is usually symptomatic of fatty degeneration; while that of its valves or tendons is the result of a previous attack of endocarditis. It may also be due to hydatids, or aneurism of the aorta. Whatever may be the predisposing cause, it is apt to be immediately produced by some sudden strain or emotion, as paroxysms of fear and anger, violent coughing, vomiting, etc. It occurs more frequently in males, and in adolescence, rather than youth. The rupture may be large and completed at once, in which case it soon fills the pericardium, and produces death; or it may be partial, without entirely penetrating the walls; sometimes only the fleshy columns, or chordæ tendinæ are broken, in which event there is great precordial oppression, combined with a loud endocardial bruit.

INTRA-THORACIC TUMORS.

Intra-thoracic tumors may be composed of an aneurism, or of fibrous or cancerous exudations. They are usually developed in the mediastinum, and are more frequently than otherwise associated with glandular structure. The symptoms are usually pain, orthopnœa, dyspnœa, restlessness, and palpitation. The pressure and irritation may produce pleural and pulmonary inflammation.

Treatment.—The treatment can hardly be expected to consist of any more than palliatives, such as inunction with iodine ointment, the administration of anodines, antispasmodics, and tonics. In one

case of this kind that came under my treatment, in which the tumor consisted of cancerous infiltration, I gave a teaspoonful of cod liver oil, and three drops of Donovan's solution, three or four times a day, with some temporary relief.

DISEASES OF THE BLOOD-VESSELS.

ARTERITIS.

Arteritis, or inflammation of the arteries, occurs rarely as an idiopathic affection. It consists of three forms: sub-acute, acute, and chronic. Sub-acute arteritis, is a local inflammation, producing redness and thickening of the artery, with effusion of lymph into its cavity, and coagulation of blood within it. In this case, the artery may be felt like a tense cord running along the limb. The symptoms are, tenderness or swelling of the affected part, with violent pain, absence of arterial pulsation, a sensation of numbness, or even paralysis, and a tendency to gangrene in the parts receiving blood from the diseased artery.

Acute, encysted, or effused arteritis, has a tendency to involve the arterial system generally, and produce rapid suppuration. It may be idiopathic, or traumatic. It is distinguished by violent fever and throbbing of the arteries. These symptoms are succeeded by adynamic fever, consisting of a frequent, feeble, and irregular pulse, rapid respiration, subsultus tendinum, typhomania, and livid vesications.

Chronic inflammation of the arteries may result in thickening, softening, ossification, occlusion, and other forms of degeneration of these vessels.

Causes.—The causes of arteritis are, in many instances, not less obscure than the symptoms. Among the most frequent may be mentioned, accidental or surgical wounds, the tying of arteries, sudden and great elongation of the vessels, exposure to cold, acrid and poisonous substances, repelled cutaneous eruptions, the metastasis of gout and rheumatism, the use of alcoholic liquors, tobacco, and mercury.

Anatomical Characters.—Redness of the internal coat, accompanied with a roughness or loss of polish, injection of the vasa vasorum, softness, friability, loss of elasticity, or thickening of the

parietes, and the occurrence of crude coagulable lymph, or pus in the vessels.

Treatment.—The treatment of arteritis consists in thoroughly evacuating the bowels, by a purge of podophyllin, anti-bilious physic, a hot bath, and sufficient veratrum viride to control the circulation. When local applications can be applied, hot soda water in the form of packs, should be used until, the active inflammation is controlled. In the chronic form, stimulating liniments and counter-irritation, may be applied over the inflamed part. When fever and delirium ensue, a lobelia emetic should be administered, followed by capsicum, quinine, and iron. In cases where coagulable lymph has accumulated in the vessels, and obstructed the circulation, iodide of potassium, electricity, and alterative doses of podophyllin, phytolaccin, and irisin, should be administered. Five or ten grains of carbonate of ammonia, administered every two or three hours, has also been recommended in this disease, and proved beneficial in many cases. Bleeding, scarifying, cupping, leeching, and mercurials, have had their advocates.

DISEASE OF THE PULMONARY ARTERY.

The pulmonary artery may become the seat of inflammation. It may arise from phlebitis, exposure to cold, rheumatism, Bright's disease, and as an accompaniment of certain forms of pneumonia. When it has existed, adherent clots are observed in the coats of the vessel.

It is seldom the seat of *morbid growths.* Its canal may become contracted or obstructed, owing to the formation of a fibrous clot, or to the pressure of a simple or cancerous tumor, or an aortic aneurism, or to that resulting from extensive thoracic effusion, or the narrowing may be congenital, as has been observed in cases of phthisis.

The symptoms of this condition are, difficult breathing, an habitual small, rapid, regular pulse, increased action of the heart, a livid hue of the surface, and a superficial systolic murmur along the vessel, and over the base of the right ventricle.

Dilatation may sometimes occur as a sequence of hypertrophy

of the right ventricle. The vessel may also become ulcerated or ruptured. Aneurism is rarely observed.

Treatment.—The treatment is that peculiar to general arteritis, with the exception that urgent symptoms of dyspnœa may sometimes require attention.

AORTIC PULSATION, OR PALPITATION OF THE ARTERIES.

Aortic pulsation is characterized by violent throbbing, observable at the epigastrium, or the umbilicus. By palpation, we detect a jerking pulse, synchronous with the systole of the heart. While auscultation reveals a systolic bellows murmur, arising from anæmia, pressure with the stethoscope, displacement of the artery, or to compression, exerted by a tumor lying over the vessel. This pulsation is frequent in uterine difficulties, hypochondriasis, derangement of the digestive organs, structural affections of the stomach, and duodenum, chlorosis, arthritis, etc. Strong green tea, or the use of tobacco, may give rise to it. In some cases, it may be difficult to distinguish it from aneurismal pulsation, especially if there are any cancerous or non-malignant growths situated over the vessel.

Treatment.—The treatment will depend much upon the cause. When associated with dyspepsia, as it mostly is, the dyspeptic mixture, given in one dram doses, four or five times a day, will relieve it. If caused by nervous affections, cypripedin and iron should be given in the proportion of two grains of the former, and three of the latter. To relieve the urgent symptoms, five or ten drops of the tincture of veratrum viride may be given at bedtime.

Congestion of the portal circulation also gives rise to this disease, and may be relieved as directed under that head. From one-eighth to one-fourth of a grain of hyoscyamin, taken at bedtime, has also been found beneficial in some cases.

NON-INFLAMMATORY ORGANIC ALTERATIONS OF THE ARTERIES.

Contraction of the *aorta* may result from thickening of one or more of the coats, or a deposition of foreign matters, in their sub-

stance, or from mere stricture, without any alteration. In the former case it may affect the vessel to a considerable extent, but in the latter, it is limited.

The coats of the arteries may lose their elasticity, become white, more opaque, and denser than in health, without any other apparent change, which condition may predispose to dilatation, which will be considered in our article on aneurism. In other instances, they may be thickened, producing a decrease in their caliber, and occasionally complete obliteration. This condition may occur near the termination of the arch of the vessel, where it is united with the ductus arteriosus.

Of the morbid products, cartilaginous patches on the inner surface are most frequent. These consist, first, of a viscid gelatinous exudation, of a pale, rosy color, which gradually become changed into firm, white patches. Mineral, or ossific, amyloid, and atheromatous, or fatty degnerations, occur most frequently in advanced life. The atheromatous deposits appear at first in numerous minute granules, which coalesce and form nuclei, which may become the matrix of a calcarerous product, or produce ulceration, or absorption of the middle and inner coat, and thus escape into the current of the blood, leaving small ulcers behind them. This deposit occurs most frequently near the arch of the aorta. At first the deposits lessen the caliber of the vessel, but in a more advanced period, dilatation results from diminution of the contractile power of the outer arterial coats. The formations of abscesses, rupture, hemorrhage, occlusion of the arterial trunk, owing to the exudation of fibrin on the roughened lining membrane, and gangrene, are occasional consequences resulting from atheroma and ossification.

In the amyloid degeneration, the tissues supplied with blood by the affected arteries become involved in the morbid process.

Ulceration may result from irritation and inflammation produced by the calcareous deposits, apertures made by the atheromatous matter, through the inner coat, or from the detachment of the cartilaginous scales from the surface of the vessels. The ulcers may be of the size of a split pea or a mustard seed, and are sometimes deep-seated, but occasionally produce perforation of all the coats of the artery, giving rise to fatal hemorrhage. The morbid conditions, enumerated above, are seldom found separate, generally several are united in the same vessel.

Treatment.—It is probable that little more can be done in these cases than the administration of general tonics, such as iron, hydrastin, alnuin, cod liver oil, Mecca oil, and by maintaining a soluble condition of the bowels, with sulphite of soda. From ten to thirty grains of the sulphite of soda should be administered every night, upon retiring. The compound syrup of stillingia, and the tincture of kalmia latifolia, in the proportion of one pint of the tincture to one ounce of the syrup, administered in dram doses four or five times a day, has proved beneficial in a few cases.

OSSIFICATION OF THE ARTERIES.

Ossification of the arteries is characterized by the presence of earthy, or calcareous matter. This disease may be distinguished by the hardness and diminished compressibility of the vessels beneath the fingers. All parts of the arterial system are liable to it. In vessels containing venous blood, they are rarely observed. The ossification may be universal, or partial, although the latter is usually the case. It is more apt to occur in adolescence, than during any other period of life, and attacks men more frequently than women. The deposit generally occurs between the middle and internal coats, appearing at first in small scales, or plates, which gradually increase in number, and at length coalesce, forming large patches, and sometimes complete bony tubes.

Ossification may produce inequalities of the inner surface of the artery, rupture of the lining membrane, or the coats, attenuation of the middle coat, inflammation, ulceration, exudation of fibrin, coagulation of blood, atrophy, gangrene, or mortification.

Causes.—It is highly probable that gout and rheumatism favor calcareous deposits in the arteries; in which case, it results from vitiation of the blood. Old age strongly predisposes to the disease, and it is so common during this period, that it might almost be considered a normal result of advanced life.

Treatment.—Several cases where it has been supposed that ossification of the aorta occurred, it has been removed by administering two or three grains of citric acid, four or five times a day, in a wineglassful of the strong decoction of eupatorium purpureum. The general health should be protected, and the bowels maintained

in a regular condition, by means of sulphate of soda. The ossific tendency may be obviated by the use of diuretics, baths, and abstinence from animal food.

ANEURISM.

An aneurism is a dilatation of an artery, consisting of a growth and a change of structure. Three principal forms of aneurism are usually described. *True* aneurism, which consists of a sac formed by one or more of the arterial tunics. *False* aneurism, formed after a puncture of an artery by a dilatation of the adhesive lymph by which the puncture was united. *Diffused* aneurism, formed when an artery is lacerated by fractured bone, or ruptured by a blow, without a wound in the skin.

The most common form of aneurism is that of the aorta; the next, popliteal artery; third, femoral in the groin; fourth, carotid; fifth, subclavian; sixth, axillary; seventh, external iliac; eighth, innominata; and in other arteries only occasionally.

Pathology.—The formation of an aneurism is preceded by some disease of the artery, and generally commences by a giving way of its middle and internal coats at the site of some atheromatous spot, after which the pressure of the blood dilates the external or cellular coat into a pouch.

They may be produced by a predisposition to the disease, strong mental emotions, injuries, great bodily exertion, etc.

Diagnosis.—If the aneurism be seated in the neck or limb, it appears as a tumor in the course of an artery, and pulsating with it. The tumor is round, soft and compressible, and yields a peculiar fluctuation upon pressure. Pulsation synchronous with the action of the heart, is the diagnostic symptom. It is of a slow, expansive and heavy character, as if the whole tumor were enlarging under the hand. Tumors in the vicinity of arteries may be distinguished from aneurisms by the absence of this pulsation.

Aneurisms seated internally may occupy the cavity of the cranium, thorax, or abdomen. As regards the first, little is known during life; for all the symptoms which they produce may arise from other causes. Post-mortem examinations have occasionally revealed aneurismal enlargements, or, more properly, dilatations of the carotid, vertebral, and basilic cavities, and death with

apoplectic symptoms resulted from their rupture. In speaking of thoracic and abdominal aneurism, the diagnosis will be treated specially. In this connection we might add, that an aneurismal tumor seated in the chest is principally known by an unnatural pulsation felt by the patient, together with symptoms of disordered circulation and respiration; and, if in the abdomen, it may be observed through the parietes.

Aortic aneurism is more common in men than women. It is a disease occurring more frequently in advanced life, than during any other period. It may result from osseous or calcareous deposits, or atheromatous or fatty degeneration of the coats of the vessel.

Prognosis.—As an aneurism enlarges, it usually becomes strengthened by the adhesion of its walls to the adjacent cellular tissue, although its coats are thinned by gradual extension. The gradual extension of an aneurism upon contiguous tissues produces their absorption; thus, the abdominal and thoracic viscera, the bones, and even the trachea and bronchia, are not unfrequently destroyed by constant pressure of aneurismal tumors. The disease may result in a spontaneous cure, by the gradual cessation of the circulation of blood, the formation of firm coagula in the sac, and the gradual absorption of the tumor; or it may prove fatal by the rupture of the sac and hemorrhage, or by pressure and absorption upon the spinal column, or other vital parts.

Aneurisms of the thoracic aorta chiefly occur in the ascending portion, and in its arch. When they form at the entrance of the aorta, or in the coronary arteries, there are no signs by which we can detect their existence. Death may result from effusion of the blood into the pericardium, trachea, pleural cavities, or bronchial tubes. When it is situated a little more distant from the heart, or at the arch of the aorta, it may attain a large size, and its symptoms are easily discerned. The tumor may press upon the trachea, and produce difficult respiration, or it may cause symptoms analagous to those of laryngitis, when affecting the recurrent nerves. It may also press upon the œsophagus, and cause the ordinary symptoms of that tube. In such cases there may be cardiac disease, pulsation within the chest, stricture of the esophagus, ulceration, and copious and fatal hemorrhage. It may sometimes obliterate the vena cava superior, or wear away the bones of the vertebræ,

causing pain, radiating frequently in the direction of the intercostal nerves, and ultimately palsy; or it may produce pressure upon the thoracic duct, causing engorgement of the absorbent vessels and glands, and inanition. In fact, whatever parts the aneurism may reach, or subject to its pressure, may have their functions suspended or disturbed, and their structures obliterated.

Symptoms.—The general symptoms of thoracic aneurisms are obscure, owing to their similarity to those arising from cardiac affections. When the tumor is of considerable size, there is generally much irregularity in the action of the heart, with some difference in the force of the pulse in the two radial arteries, the superficial veins of the neck and chest are turgid, and there is œdema of one or both extremities. The first symptom experienced is usually that of tightness, fulness, or oppression of the chest. The respiration is hurried and laborious, and is usually attended with dyspnœa and orthopnœa. It is sometimes accompanied by harsh, wheezing, hissing, or stridulous sounds, and alteration of the voice. A troublesome, and even violent or convulsive cough, attended with hemoptysis, or bloody expectoration, is a common symptom. Pain, of various degrees, is frequently experienced in the chest and back. It may be vague and dull, acute, lancinating, or of a boring character, being most constant and severe when erosion of the bones of the spine, sternum or ribs is going on. It is often confined to one spot. There may be painful deglutition, and eructations of gases, resulting from compression of the œsophagus. Adynamic palpitation, syncope, œdema of the face and limbs, pallor, or lividity of the complexion, swelling at the lower part of the neck, dropsy of the serous cavities, cerebral oppression, varix of the external veins of the chest, etc., may arise from pulmonary congestion or inflammation, or from pressure upon the venous or lymphatic trunks, but more particularly from disease of the heart. There is frequently much derangement of the pulse. When the aneurism is situated between the heart and the arteries of the arm, the vibratory motion received by the blood in its passage is extended in a greater or less degree to the artery at the wrist. The pulse at the wrist is quite different on the opposite sides, being extremely feeble, or even disappearing in the left, owing to compression or obstruction of the innominata, or left subclavian. Dulness of percussion over the middle and upper parts of the chest

often exists in cases of thoracic aneurism. Palpitation reveals a vibratory thrill, similar to the motion of a purring cat, over the middle or upper part of the sternum, and above the clavicles.

None, however, of the preceding symptoms are so characteristic as *pulsation*, distinct from that of the heart, felt at the upper part of the chest, beneath the ribs or sternum, or above the sternum and clavicles. It is, however, different from the systole of the heart, with which it is synchronous, and even from the sounds produced by valvular disease, being louder, more hollow, less prolonged, and commencing and terminating more suddenly. If traced from its rise towards the apex of the heart, it is observed to gradually diminish, and at a distance of an inch from the apex, to cease entirely, or become feeble and remote; while the systole of the heart is loudest at that point, decreasing as it recedes from it. When the first sound of the aneurism can be distinguished from that of the heart, the absence or presence of the second is of very little importance. The first is owing to the friction of the blood against the orifice, and sides of the sac. The second has been ascribed to a regurgitation of blood from the aneurismal tumor during the diastole of the ventricle; or to a murmur from the semilunar valves propagated along the column of blood in the artery. These impulses, however, are best explained by Dr. R. D. Lyons, of Meath, viz.: that the wave of blood sent forth by the systole of the heart produces the first pulsation, and that the contraction of the aorta following each expansion, each movement driving blood into the sac, causes the second. The aneurismal murmur and the purring tremor are more observable in aortic regurgitation and anæmia, the blood-vessels being imperfectly filled, hence they are prominent symptoms.

A bronchial sound may be heard in respiration, in both sides of the chest, along the course of the aorta, arising from narrowing of the trachea, and the pressure of the tumor. The diagnosis is much assisted by the attitude of the patient.

Abdominal Aneurisms.—Aneurisms have been observed in the cœlic, hepatic, splenic, and superior mesenteric, and iliac arteries. The most characteristic sign of abdominal aortic aneurism, is a strong, full, and expansive impulse, felt over the surface of a fixed and compressible tumor. The pulsation is usually single, although it may be double. Dulness on percussion is observed, if the tumor

be large. The stethoscope reveals a short, loud, abrupt, bellows murmur, less loud and hoarse than that of thoracic aneurism. It is usually heard over the course of the artery, in the front of the abdomen, and in the back. If a small artery runs over the sac, it may, when pressed upon by the stethoscope, yield a murmur, which might be mistaken for the aneurismal. It is, however, more superficial, and hissing, confined to one spot, and disappears entirely, after the removal of the pressure.

Diagnosis.—In the *diagnosis*, it is necessary to remember that simple or malignant tumors having their seat over the artery, receive pulsation from it, and that, if they produce much pressure upon the aorta, a murmur will result. A history of the case will also aid in the diagnosis. The following facts should also be remembered in forming a diagnosis:—Aneurism pulsates from the first, while tumors do not, until they attain a large size. The latter are firm and hard, from the commencement, while the former only become so when somewhat advanced. Gentle, continued pressure, may sometimes diminish the size of the tumor.

Symptoms.—Abdominal aneurisms may give rise to dyspepsia, vomiting, colic, flatulency, constipation, jaundice, hepatitis, nephritis, cystitis, etc. They may cause caries, or absorption, by pressure upon the spine, and the most acute abdominal and lumbar pains, which occasionally extend down to the testicles, scrotum, and lower extremities.

Treatment.—Popliteal aneurism may be cured by securing perfect or complete rest to the limb, and the frequent application of hot packs to the tumor, for several consecutive days. This may be associated with stimulating liniments. One that I have used in some cases, is composed of equal parts of the compound tincture of myrrh, oil of origanum, and iodine. This should be thoroughly applied, and previously to each application of the hot pack. If this does not remove the tumor in the course of a few weeks, the gentle application of electricity, or galvanism, should be resorted to once or twice a day. In some cases, gentle pressure, secured by means of well-adjusted pads, may be applied. The diet should be of a nutritious character, and if the patient be of a strumous diathesis, iron, cod liver oil, and general tonics may be prescribed.

Aneurisms occurring in other portions of the body, accessible to

topical treatment, should be treated in the same manner. Where this method fails, the arteries should be ligated between the aneurisms and the heart. In aneurism of the aorta, or any of its branches, veratrum viride should be given to maintain the pulse at a natural standard, as near as practicable. Strict rest should be enjoined, and a tonic and dietetic course of treatment instituted.

Extensive bleeding, in connection with a thorough mercurial course, has been highly recommended, but the most extensive observations have shown the practice to be unsuccessful. Dr. Copland remarks that nearly all cases of aneurisms immediately become aggravated upon being subjected to this treatment. Dr. Charles H. Moore has adopted the practice of introducing a quantity of fine wire into the aneurismal tumor. He adopts this plan to establish points for the coagulation of the fibrin. The practice can only be adopted in sacculated aneurism. Dr. William Murray publishes a case of aneurism of the abdominal aorta, cured by administering chloroform, and adjusting a tourniquet, so as to compress the aorta just above the tumor. This was continued for five hours, at the expiration of which, pulsation ceased in the tumor, and recovery ultimately followed. Dr. Roberts has published a case where aneurism of the aorta was cured by administering ten or fifteen grains of iodide of potassium, three or four times a day. Several cases of abdominal and aortic aneurisms have also been reported as cured by the application of galvanism, strong currents being passed through the tumor for half an hour, or hour, three or four times a day.

PHLEBITIS.

Phlebitis is characterized by inflammation of the inner membrane of a vein. It may occur as the effect of blood-letting, the application of ligatures, pressure upon some venous trunk, &c. The pathological effects vary according to the extent and severity of the inflammation. In most cases the affected vein is swollen, thickened, and indurated to such a degree as to resemble an artery. A diffused swelling, connected with acute pain, coated tongue, scanty urine, constipated bowels, and pyrexia, are among the prominent symptoms of this disease.

Anatomical Characters.—Upon examination, the adipose, cellular, and subcutaneous tissues are found filled with fluid; and when

the parts are laid open, clots of blood and lymph are observed adhering to the inner coats of the veins. If the inflammatory process continue, the clots of blood and lymph are converted into purulent matter, rupturing the vessels, and forming a deep phlegmonoid abscess in the adjacent tissue.

Symptoms.—Phlebitis is attended with pain, tenderness, and swelling along the course of the affected vessels, and in the adjacent tissues. The inflamed veins often feel like hard cords, knotted at intervals, unless the limb become greatly distended by effusion from obstruction to the returning blood, and the extension of the inflammation to other parts. The consequences of this obstruction are only serious when the large veins are involved. The inflammation may now subside, and the circulation of the blood through the vessels be restored, owing to a solution of the coagulum. Usually, however, the obstruction continues, and the inflammation passes on to suppuration, in which event the pus may be confined to the inflamed vessels by coagulated blood and effused lymph, producing abscesses along the vein; or it may be carried along the passage of the blood, contaminating the circulation, and producing the most serious constitutional difficulties.

When phlebitis occurs in depraved constitutions, the formation of pus is not preceded by nor attended with adhesive inflammation, and there is no coagulation of blood within the vessel. In such cases, the pus enters the circulation freely from the internal surface of the vein, producing abscesses, and purulent deposition, in various parts of the body, usually terminating in emaciation, debility, and death.

The constitutional symptoms in the early stages of the ordinary variety, are those of common symptomatic fever, commencing wit chills, followed by more or less fever. When the process of suppuration is about to commence, there are repeated chills, a general relaxation of surface, and profuse night sweats. When the pus has entered the circulation, the fever assumes a typhus character; the pulse is frequent, small, and weak; the respiration hurried; the countenance anxious, sunken, and haggard; the skin pale; tongue covered with a dark sordes; stomach irritable; bowels irregular, with extreme restlessness; muttering delirium, coma, and death. Or the symptoms may continue in a mild form for weeks, or even

months, and the patient recover, but with a shattered constitution.

Diagnosis.—When phlebitis occurs in the extremities, the diagnosis is not usually difficult, but it is often attended with much obscurity, when the internal veins of the abdomen, or thorax, are the seat of inflammation. The occurrence of a hard, purplish œdematous swelling, in exterior parts, may be regarded as an indication of the disease, when seated internally.

Portal Phlebitis.—An attack of portal phlebitis usually makes its appearance abruptly. The first observable symptom is generally a dull, heavy pain in the epigastrium or hypogastrium, increased by pressure, which gradually extends over the entire abdomen as the case advances, rendering it more or less tympanitic. The superficial veins are occasionally distended. Febrile symptoms appear, followed by chills. These chills occur regularly several times during a day, and are generally unattended with perspiration. There may be jaundice, and enlargement of the spleen and liver. Typhoid symptoms may supervene, and the disease terminate fatally. The complaint usually continues from one to three weeks.

Cause.—The cause of portal phlebitis is somewhat involved in obscurity. It may be an idiopathic affection, or originate from inflammation, local injuries, etc. A case is on record, in which it was caused by a fish-bone, which had passed through the coats of the stomach, and produced perforation of the vein. The New York Medical Times states a case in which it was produced by the partial strangulation of a fold in the intestine, passing through a rupture in the omentum.

Anatomical Characters.—The veins are found of a grayish color, and greatly thickened, preventing collapse of the vessels. Coagulated lymph may adhere to the internal surface, and the clots attain a large size, so as nearly to fill the vessel. Pus, mingled with blood, is found in the trunk, and in its intestinal and hepatic ramifications, and occasionally in the splenic vein. The liver, the mesenteric folds, and the peritoneum may exhibit inflammatory signs.

Chronic Phlebitis.—Post mortem examinations have revealed various organic changes occurring in the veins, the result of chronic inflammation. The morbid conditions observed, are induration, soft-

ening, ulceration, perforation, and rupture. They are occasionally thinned and distended, and obliteration of the valves may occur. Calcareous deposits have been observed between their coats.

Phlebolites, or small, loose concretions, varying in size from that of a millet seed to the size of a pea, are occasionally met with in the veins. These, however, in no way obstruct the circulation of the blood, as they usually lie in dilatations. There may be only one or two, or a dozen or more. These concretions are probably formed from a coagulum of blood or lymph, in which calcareous deposits may be subsequently deposited, being composed chiefly of animal matter, and the phosphate and carbonate of lime.

Steatomatous tumors and hydatids may occasionally occur in the veins.

Varicose Veins.—A varicose condition of the veins, consists of a dilatation of these vessels, produced by a local retardation of the circulation of the venous blood, or a relaxation of the parietes, not unfrequently the two causes acting conjointly. The dilatation may be extensive and uniform, or local and irregular, and the vein may be considerably lengthened, presenting a tortuous appearance. Generally there are knots along its course. Thickening and attenuation of the coats of the vessels may be observed. When there is obliteration or obstructions of the internal veins, there may be an enlargement of the external ones, caused by the pressure of the accumulated blood which seeks a passage through them. Owing to this pressure, its return from below is impeded, and consequently tumefaction and œdema of the limb may arise, sometimes associated with pain, inflammation, and obstinate constipation. Not unfrequently chronic phlebitis occurs in the varix, degenerating into ulceration, producing a solution of the venous tunics, and the formation of indolent ulcers. This is more liable to occur on the extremities, and is more common in women than men. When these ulcers form, they usually present a dark purplish appearance, with indurated edges, and discharge an ichorous sanious pus. The ulcers have but little tendency to heal, and frequently extend nearly around the limb, and prove a most troublesome disease.

Varicocele.—Varicocele is a chronic inflammation of the spermatic vein, including those of the scrotum. When the spermatic vein is the seat of the difficulty, it usually manifests itself in the form of

small semi-elastic tumors, within the sheath of the spermatic cord, which sometimes become quite large and painful. The general character of the disease, however, is that of chronic phlebitis.

Treatment.—The constitutional treatment of phlebitis, consists in opening the bowels with a saline purge. One or two drams of sulphite of soda, administered once or twice a day, will usually answer this purpose very well. Then a full round of quinine and iron should be taken in the course of twelve or twenty-four hours, in the proportion of one-half dram to a dram of the latter, to ten or fifteen grains of the former. This should be followed by five or ten drops of the tincture of ferri chloridii, administered four or five times a day. Iodide of potassium, and carbonate of ammonia, are also valuable remedies in this disease. In the chronic form of phlebitis, much benefit will be derived from an occasional lobelia emetic, and a sulphur vapor bath. This is especially the case when the inflammation is associated with a syphilitic or mercurial contamination. The topical applications should consist of cloths saturated in equal parts of the tinctures of lobelia and arnica, or of flaxseed poultices, moistened in the same.

The only variation that I have made in these applications is in that of a varicose condition of the limbs, in which I have uniformly applied a solution of the muriated tincture of iron with almost entire success. My method of applying it is to add two ounces of the tincture to a pint of rain water, and keep cloths moistened in this solution constantly to the affected limb. Rest is indispensable in the successful management of phlebitis. The diet should be of a nutritious character; and in cases of much debility, porter and light wines may be drunk liberally. When the blood becomes extensively contaminated with the products of venous inflammation, and there are fever, and other constitutional symptoms of an adynamic or typhous character, in addition to the above treatment, we have found iodide of ammonia and chimaphilin valuable remedies. One grain of the former, and two or three of the latter, may be given every two or three hours; and if the prostration do not yield, five or ten grains of capsicum may be administered in a wine-glass of cream four or five times a day. Twenty or thirty drops of the compound tincture of serpentaria, in camphor, may be given at bedtime, when there are much restlessness and disturbed sleep.

The treatment of portal phlebitis is essentially the same as that of general phlebitis, with the addition of small doses of podophyllin, in combination with the sulphite of soda, and the application of hot soda packs. The hot packs should be used in all cases of phlebitis of the internal organs. When phlebitis terminates in varicose ulcers, they should be dressed with a mild zinc ointment, the limb firmly bandaged, and kept constantly moistened in cold water. If it can be elevated and kept quiet until the ulcers are healed, it is much better. The constitutional treatment is essentially the same as that of phlebitis. In varicocele, a suspensory bandage should be worn, and the tincture of iodine applied along the track of the spermatic vein once or twice a day. The irritating plaster may be resorted to when this fails. When medical treatment fails in these cases, as well as in varix of the veins in other situations, the veins should be ligated.

PHLEGMASIA DOLENS.

Phlegmasia dolens, (milk-leg, crural phlebitis,) is an inflammation of the veins of the leg, characterized by a brawny and painful swelling, mostly caused by the spontaneous coagulation of blood within the internal or external iliac and femoral veins, generally making its appearance on the second or third week after confinement. It commences generally in the uterine branches of the hypogastric veins, especially in puerperal women. It is rarely met with after first labor, and occurs in those who have been much weakened by flooding, or other causes. Not unfrequently it has been observed toward the termination of uterine cancer. It occurs generally in the left leg, exhibiting to the touch numerous irregular prominences under the cutis.

Pathology.—Various opinions have been held as to the pathology of phlegmasia dolens. At first, it was considered a metastatic secretion of the milk, an inflammation of the absorbents, and still later, general inflammation of the cellular tissue, muscles, and inner surface of the skin. Other writers have ascribed it to phlebitis, but its point of origin was not clearly established until the inflammatory course was traced to the uterine veins by Dr. Robert Lee. Morbid anatomy has also demonstrated that it may take place in the unmarried, and occasionally in the male sex. In all cases, the

proximate cause is the same, the disease being due to inflammation of the iliac and femoral veins.

Dr. Tilbury Fox's essay on the disease, is well deserving of careful study and investigation.

Symptoms.—In the course of two or three weeks after confinement, pain and uneasiness are complained of in the hypogastric, lumbar and inguinal regions. On examining the limb, it will be found tense, elastic and shining, mostly painful to the touch. It will also be flexed, and quite motionless, as if paralyzed. There is also swelling of the labium pudendi.

The skin will be hot, the pulse quick, with great thirst and restlessness. If the disease be allowed to advance, the tongue is covered with a dark sordes, the respiration becomes hurried, and delirium, coma, and death, rapidly follow. Or these symptoms may continue in a mild form for weeks, or even months, and the patient recover, but with a shattered constitution.

The above are the more ordinary symptoms, yet they vary exceedingly in different cases. Sometimes the pain commences in the knee, and is of a sharp, darting character, extending to the groin. When the swelling is at its height, it is almost uniform over the entire limb, which is unnaturally white, hot, firm, elastic to the touch, and has a peculiar glistening appearance. When cut, a small quantity of liquid is exuded. Red lines are sometimes observed in the course of the crural veins, and red patches interspersed upon the limb. The tenderness is greatest along the femoral vein, which may almost be felt like a hard cord. The secretions of milk and the lochia will be interrupted, the bowels become irregular, and nausea and vomiting may ensue. At other times, the disease may assume a decided periodic character. The symptoms, such as pain, redness, and fever, will all become exceedingly aggravated, at a certain stated period, and remain so for a few hours, followed by a distinct remission; or the disease may be transferred to other organs, as the peritoneum, pleura, or lungs, producing extensive organic disease.

The disease may occasionally extend to the arm of the affected side.

The acute stage generally continues about two or three weeks, but the limb frequently remains swollen and feeble, or almost useless, for many weeks, or even months. The prognosis is usually

favorable. When an erysipelatous inflammation occurs in the limb, or when abscesses are formed in it, and about the pelvis, the prognosis is usually unfavorable, the disease terminating fatally in many cases.

Anatomical Characters.—Signs of inflammation have been observed in the femoral vein, frequently extending to the veins of the limb, and occasionally to all the venous ramifications. Coagulated blood, effused fibrin and pus, may fill the caliber of these vessels, and coagula have also been observed in the internal, external, and primitive iliac veins.

Treatment.—Dr. Tanner recommends the application of leeches above and below Poupart's ligament, and the administration of digitalis and blue pill.

We have been in the habit of treating this disease most successfully by first administering a lobelia emetic, followed by a thorough alcoholic spirit sweat, and an active cathartic of anti-bilious physic, in connection with quinine. About one dram of the former and ten grains of the latter, mixed and divided into two powders, and administered three hours a part, is about the requisite quantity. The limb should be at once elevated, and a roller applied, and kept thoroughly moistened in equal parts of whisky and water. If there be tenderness of the abdomen, and irritation or inflammation of the uterus, hot packs should be applied to the hypogastrium, and hot vaginal injections used. As soon as the purge has operated, administer every day sufficient doses of sulphite of soda, to keep the bowels slightly excited, and give the following mixture:—Take acetate of potassa, one dram; fluid extract of pareira brava, and diosma crenata, of each, one ounce; aqua pura, three ounces. Mix, and administer a teaspoonful every one or two hours. The surface should be bathed once or twice a day, in hot alkaline water, and aconite or veratrum given to control febrile excitement, if it exist.

As soon as the active symptoms subside, ten drops of the syrupus ferri iodidi, and one teaspoonful of cod liver oil, may be administered three or four times a day. Or, if the oil cannot be tolerated, two ounces of the tonic tea, and half an ounce of the carbonate of iron, may be added to a quart of port wine, and a wine glassful taken four times a day, after each meal, and upon retiring. If there be much œdema of the limb, it should be thoroughly bathed

in hot Mecca oil, three or four times a day, and firmly bandaged after each application.

AIR IN THE VEINS.

Great danger may result from the entrance of an undue quantity of air into a vein during surgical operations. When this condition occurs during an operation upon the sternum, neck, shoulder, or axilla, it is characterized by a hissing, bubbling, or gurgling murmur, pallor or lividity of the countenance, an imperceptible pulse, labored perspiration, violent and irregular action of the heart, oppression of the chest, extreme faintness, convulsions, and death. It is caused by the mechanical interference of the air with the action of the heart, and the difficulty of forcing frothy blood through the pulmonary capillaries. When it enters the circulation through the veins of the uterus, the symptoms are as well marked as in the preceding cases.

Legallois, in 1829, first directed attention to this occurrence. He observed a rabbit struggle convulsively, and die in less than three minutes, after having two successive inversions of the uterus after parturition. The right auricle contained air-bubbles, while air was also observed in the pulmonary artery, vena cavæ, etc. Dr. Cormack has shown that the communication between the cavity of the uterus, and the circulation of blood in the inferior vena cava, is direct and easy; so that air, when once introduced into the uterine veins, must soon be carried to the right auricle, producing frothing, aeriform distention of the right side of the heart, obstruction of the pulmonary artery, and congestion of its capillaries.

Anatomical Characters.—The anatomical appearances observed, are the presence of air in the right cavities of the heart, a frothy state of the blood, owing to the air being mingled with it, and bubbles of air within the larger veins and pulmonary arteries.

Treatment.—In cases in which this accident occurs, whether from surgical operations, parturition, or other causes, the source of the ingress of air into the veins should be attended to, by plugging the vagina, ligating veins, etc., and the administration, at the same time, of active stimulants, such as capsicum, camphor, and ammonia. The patient should be placed in a recumbent position, and hot sinapisms applied to the chest, spine, and extremities. Friction and electricity may also be employed.

SCORBUTUS OR SCURVY.

Scorbutus or scurvy is characterized by a peculiar debilitated state of the system, a depraved condition of the blood, a tendency to hemorrhage and petechiæ, and a state of congestion in various parts of the body, particularly in the gums, unattended by any febrile complication.

This disease appears to have been known to the ancients. The first distinct account of scurvy, is contained in the history of the Crusade of Louis IX. against the Saracens of Egypt, during which the French army suffered greatly from it. It was, however, little noticed by medical writers, until the sixteenth century, at which time it prevailed endemically in different parts of Europe, and continued, with little abatement, until the middle of the last century. Lord Anson's voyage, in which more than eighty out of every hundred of the original crews, perished from this disease, is familiar to every reader. Its prevalence, however, in Europe, has been greatly diminished, owing to the extension and improvements in agriculture, the ameliorated condition of the lower classes, and our additional knowledge of its pathology and causation. In this country it is quite prevalent among the aged inmates of prisons, hospitals, garrisons, ships, work-houses, etc. Hammond states, that at Council Bluffs, in 1820, nearly the entire garrison perished from scurvy. During the Mexican war, its prevalence greatly lessened the forces of the United States Army. During the Crimean campaign, it made extensive ravages among the English and French armies. During our late struggle, it prevailed extensively, thus contributing largely to the mortality of our armies.

Pathology.—There cannot be any doubt, that the essential characteristic of scurvy, is an alteration in the composition of the blood, but respecting what ingredients are deficient, or in excess, or deteriorated, our knowledge is very imperfect. There is probably an increase of the water and fibrin, and a diminution of the red corpuscles. Dr. Aldridge considers, that the special deficiency relates to a diminution of certain minerals in the food, which are essential to the existence of nearly all the proximate principles, by which the animal structure is nourished and supported. These

principles are phosphorus, sulphur, lime, potash and soda. Dr. Garrod somewhat confirms this opinion, as he states, that the blood is deficient in potash, but he, however, attaches little importance to the absence of sulphur and soda. That this deficiency constitutes the pathological condition chiefly or exclusively, in all cases, may be doubted, from the fact, that the addition of salts of potassa to the food, although highly useful, yet is not always the most effective mode of treatment.

Cause.—Scurvy is produced by a deficiency of the nutritive principle contained in vegetable food. It was at one time attributed to the free use of salted meat. It is certain, however, that it is not produced by this diet, excepting when it displaces articles of food essential to the normal condition of the blood. According to Dr. Garrod's theory, it may be attributed to a deficiency in the diet of the salts of potassa, these salts being abundant in fresh succulent fruits or vegetables, especially potatoes. Experience has shown, that those substances which act as anti-scorbutics, in which the dietetic principles of the blood are abundant, may prevent the development of the disease.

Among the auxiliary causes may be enumerated fatigue, depressing moral influences, exposure to cold and wet, deficient ventilation, the use of innutritious and unwholesome food, especially of salt meats to the exclusion of fresh fruits, vegetables, etc., the use of intoxicating liquors, previous disease, famine, impure water, sedentary habits, want of cleanliness, the various abuses of the system, and the debility of old age. The most frequent cause, however, is a deficiency of succulent matter, such as apples, tomatoes, potatoes, turnips, cabbage, and onions, to maintain the blood. It prevails most extensively during the winter, and is most frequently developed in the aged.

Symptoms.—An attack of scurvy is usually preceded by general debility and lassitude, an unhealthy paleness of complexion, despondency, listlessness, weariness and aching in the limbs, slight swelling, redness and tenderness of the gums, with a tendency to hemorrhage. As the disease advances, the face becomes paler, assuming a sallow or dusky hue; the lips and tongue are pallid, the breath is exceedingly offensive, the gums are more swollen and spongy, which bleed either spontaneously or on slight pressure; hemorrhage also

frequently occurs from the nose, mouth, stomach, bowels, or urinary passages, and ecchymoses are apparent on the cutaneous surface, beginning usually upon the lower extremities, and extending upward to the trunk, arms, and neck, though seldom affecting the face. They appear either in the form of petechiæ, vibices, or ecchymoses of variable size. They undergo the same successive alterations in color as when resulting from contusion, and may be produced by a slight bruise in any part of the surface of the body. They are obviously owing to the extravasation of blood within and beneath the skin. Should the disease still progress, the countenance assumes a leaden or livid hue, the fungous appearance of the gums is more marked, especially round the teeth; the latter are apt to become loose, and sometimes fall out, or else are removed easily; the surface of the lips is remarkably pale, the patient is unable to chew solid food, owing to the condition of his gums, the fœtor of the breath is almost intolerable; the skin is dry and rough, compared by Larrey to that of a plucked fowl; the ankles are œdematous, œdema of the face is not unfrequent, hard and painful tumefactions occur in the calves of the legs, among the muscles of the thighs, upon the tibiæ and lower jaw, and in the hand, with stiffness and contractions of the joints, severe pain in the extremities upon every attempt at movement, and the prostration, even before so prominent a feature, now becomes excessive. Palpitation, dyspnœa, and pain in the chest, are not uncommon. The bowels are usually constipated, sometimes obstinately so; but diarrhœa frequently intervenes, with black, or bloody and offensive evacuations. The urine is scanty and high-colored, and rapidly becomes fetid. The tongue is generally clean and moist throughout the complaint, and the appetite and digestion are immaterially affected until the disease has assumed an aggravated form. The patient usually craves food, especially fresh vegetables and fruit. Occasionally vomiting occurs, with epigastric tenderness. The pulse is usually small, feeble, and slow, but sometimes very frequent, and the temperature of the skin is lessened. The cerebral functions are rarely impaired, and the patient often retains full possession of his senses and intellect to the close. Delirium, however, occasionally occurs in the advanced stages. Nyctalopia is sometimes observed at the commencement of an attack. Frequently the patient is unable to

sleep at night. In extreme cases, or in an advanced stage of the disease, there is great emaciation. Slight exertion may produce syncope. The patient may fall into a state of collapse, especially if there has been considerable hemorrhage. Various other phenomena are often presented. Wounds, and even slight scratches, may degenerate into unhealthy ulcers, old cicatrices sometimes reopen, and existing ulcers assume a new and much worse aspect. The ulcerated portion is soft, with large, flabby granulations about the edges. A sanious liquid may flow from the ulcers, or the blood ooze out and coagulate, forming a crust which adheres to the surface, becoming rapidly increased in size. Occasionally, there is a strong tendency to local congestions, of a low inflammatory character, attended with the effusion of blood or fibrin, and sometimes coagulation of the former. These congestions and effusions may occur in the substance of the lungs; in the cavities of the pleura and pericardium, producing dyspnœa and fatal oppression; and within the cranium, giving rise to drowsiness, coma, and apoplexy. Similar extravasations may occur in the synovial cavities. Serous effusion may take place into the cellular tissue and closed cavities, resulting in general dropsy.

The course of scorbutus is variable. Owing to the greater intensity of its causes, it is more violent on sea than land.

Scurvy may exist as an idiopathic affection, but it is frequently complicated with other diseases, which greatly aggravate the danger. It may be associated with dysentery, in which case, it is styled *scorbutic dysentery*. It may also be combined with typhus and typhoid fevers, in which case, it is usually fatal.

Diagnosis.—The only disease with which scurvy is liable to be confounded, is purpura. From the latter affection, however, it is distinguished by the gradual course of the disease, the cause, the appearance of the gums, the change in the muscular structure, the separation of the cartilages, and epiphyses of the bones, etc. Although purpura is characterized by ecchymoses upon the cutaneous surface, from subcuticular extravasation of blood, yet the preceding symptoms are far more urgent and severe in scurvy.

Anatomical Characters.—The most characteristic phenomena presented upon dissection, is the extravasation of blood in the venous tissues. The following are the chemical changes which occur in

the blood, according to Hammond, Becquerel, Rodier, and others:—A relative increase of water, a decrease of red corpuscles, an increase of urine, a diminution of albumen, and of the inorganic constituents.

Coagula of blood, or of fibrin, are found in the cavities of the heart, and thin, liquid blood, in the great veins. Andral observed, in one case, the aorta distended with dark blood.

Prognosis.—When the ecchymoses are large and numerous, and when the hemorrhage from the mucous outlets is profuse, the prognosis is decidedly unfavorable. Death may ensue from effusion of blood into the serous cavities, or the parenchyma of the vital organs, or it may be induced by syncope, resulting from muscular exertion. However, in the early stages, if the causes and unfavorable circumstances which have produced the disease can be removed or corrected, the affection may have a favorable issue. The mortality from this disease among seamen and soldiers was frightful, before its pathology and causation were well understood. Associated with other complications, it contributes indirectly to their fatal termination. Its duration is indefinite, depending upon the extent to which the disease has advanced, the amount and seat of hemorrhagic extravasations, the previous condition of the patient, age, the state of the weather, etc. The recovery is usually gradual, and the system is apt to remain in a debilitated condition for a long time.

Treatment.—The treatment for scurvy consists in the use of such articles of food as will prevent its occurrence, and of food and medicine to cure it, when it exists. The preventive treatment consists in the use of fresh, succulent, vegetable matter, such as grapes, tomatoes, potatoes, baked apples, peaches, and all ripe fruits and vegetables, together with baths, cleanliness, and pure air. When a liberal supply of fresh vegetables cannot be obtained, dried fruits, such as peaches, apples, prunes, etc., should be used. It is also an established fact, that fresh lemon juice has the effect of preventing this disease. Since lemons have constituted a part of the rations of seamen, scurvy has been almost entirely prevented among them. It is also now a well-ascertained fact, that the absence of fresh vegetables, and particularly of fresh vegetable acids, gives rise to this disease. When it exists, the treatment must depend altogether upon the condition of the patient. If pre-

scribed for in the early stage, cleanliness, fresh air, salt water bathing, and a liberal amount of fresh vegetable acids, as lemon juice, unfermented cider, currant jelly, fresh or canned tomatoes, together with an occasional mild purge of sulphate of soda, will remove the difficulty. If the disease is further advanced, the muriated tincture of iron and quinine should be added to the treatment. A good prescription is, to take tinctura ferri chloridii, one dram; syrupus simplex, four ounces: quinia sulphas, one dram; mix, and give one teaspoonful every two or three hours. When the disease is connected with effusion, or extravasation of blood or serum into any of the tissues of the body, one grain of iodide of ammonia, and one teaspoonful of cod liver oil should be prescribed three or four times a day, in addition to the other treatment. If there is a spongy condition of the gums, and a softened state of the mucous membrane, myricin, rhusin, hydrastin, and iron, may be given in combination with capsicum and cream. It is in these cases, that much benefit is derived from the use of native wines, especially catawba and port. If active hemorrhage occurs, the oils of turpentine, erigeron solidago, and Mecca oil, may be used to advantage. A strong decoction of matico, drunk freely, will also arrest the hemorrhage. If a typhus condition of the system exist, brandy, capsicum, xanthoxylin, and carbonate of ammonia, are the remedies, principally, on which we should rely. Antiseptics, such as creasote, prussic acid, animal and vegetable charcoal, and baptisin, are valuable agents, when there is a tendency to putrescence, or a solution of the tissues. In cases in which hæmaturia and melæna occur, argenti nitras, in doses of one-eighth or one-fourth of a grain, four or five times a day, followed by large draughts of gum water, proves of the utmost value. As we have already remarked, scorbutus, or scurvy, is frequently associated with other diseases, such as dysentery, typhus, and typhoid fever, and especially cholera. The latter, we believe to most essentially depend upon a scorbutic diathesis. In all diseases, where this affection manifests itself, it should receive especial attention. Scurvy, above all other diseases, is most essentially influenced by the diet; hence, in all cases, it should consist of a mixture of animal broths, and fresh vegetable matter. I have, in many cases, prescribed a

gill of beef tea, and a teaspoonful of fresh lemon-juice, to be taken every two or three hours, with the happiest effect.

HEMORRHAGE.

The escape of blood from the vessels, whether by rupture or exudation, constitutes hemorrhage, *αἷμα*, signifying blood, and *ῥήγνυμί*, to break out. It was formerly supposed, that blood might escape from the vessels without rupture; but recent pathological researches tend to show, that in all cases in which hemorrhage occurs, a rupture of the vessel absolutely exists. These observations are confirmed by a careful study of the phenomena of inflammation. Dr. Todd states that the blood corpuscles are one-three-thousandth of an inch in diameter; hence, if there were pores even in the capillaries large enough to admit of their escape, they could be detected by the microscope. Virchow states that the vascular system, throughout its entire extent, is completely closed by membranes, and that, although we are not able on all occasions to point out the exact lesions of the vessels, it is evident they exist, otherwise hemorrhage could not occur. There appears to be, however, some facts that would militate against the existence of a fracture, or rupture of the vessels in hemorrhage. We are aware that all animal membranes possess the power of exosmosis and endosmosis, and that fluids may pass into and out of the vessels, according to the specific gravity of the fluid which they contain and that which surrounds them, and, although an escape of the red corpuscles may not occur, unless there be a fracture of the capillaries, or some of the larger vessels, it is very evident that the liquor sanguinis may escape by exhalation. We apprehend this to be the case in most forms of dropsy, and especially cholera, in which there appears to be a complete evacuation of the liquid constituents of the blood, by a general exudation into the alimentary canal. The progressive pathological changes, occurring in the capillaries during inflammation, also confirm this idea. We are well aware that during the stage of hyperæmia or congestion, and previously to the fracture of the capillaries, as observed in the web of a frog, an escape of the liquor sanguinis occurs, but as soon as the blood-corpuscles and fibrin accumulate in certain points, forming an obstruction to the further circulation of the blood through the vessel, a fracture is observed, and the red cor-

puscles noted to escape. The only classification of hemorrhage which appears to be of practical importance, is *traumatic*, where a vessel has been directly divided; *constitutional* or *spontaneous*, when the hemorrhage arises from some constitutional cause; *symptomatic*, when clearly the result of some other disease, as cancer, tubercle, etc.; *active*, when inflammation has preceded the disease; *passive*, when there is great debility; *vicarious*, when it is supplemental to some other discharge, as hemorrhage from the nose and lungs, instead of the catamenia, etc.; and *critical*, when occurring in the progress of scorbutic diseases.

Causes.—The causes of hemorrhage are, exposure to heat, violent exercise, intense emotions of the mind, excessive muscular exertion, sedentary habits, wounds, bruises, surgical operations, calculous urinary concretions, stimulating drinks and condiments, suppression or diminution of the habitual discharges, mechanical obstacles to the circulation, and exposure to various stimulants or irritants. Plethora and anæmia, are also favorable to hemorrhage. Degeneration of the tissues of the coats of the vessels, and diseases of the liver and spleen, also tend to produce hemorrhagic diathesis.

The seat of the hemorrhage, to a limited degree, may be said to vary with the patient's age: thus, epistaxis is most frequent in youth, hemoptysis, hæmatemesis, melæna, and metrorrhagia, in advanced life, and cerebral hemorrhage, and hemorrhoids, in old age.

Symptoms.—The symptoms essentially depend upon the cause, situation, amount of the discharge, and condition of the patient. When a plethoric state of the blood has previously existed, with cephalalgia, heat of the surface, and a full bounding pulse, a moderate hemorrhage may be beneficial; but, in asthenic cases, the slightest discharge serves to increase the vital depression. The symptoms characteristic of these cases, are a rapid pulse, pallor of the face, deep sighing, loss of vision, coldness of the extremities, great restlessness, delirium, and syncope, upon attempting to sit. When no loss of consciousness exists, even though there is great vital depression, among the most unmistakable symptoms of a fatal issue, none is more alarming than the patient's feeble expression of perfect ease and contentment, and his desire to be let alone.

The hemorrhagic diathesis is equally manifested in boys and girls, though, during adult life, men are more frequently affected than

women. It may be hereditary, or be induced by an insufficient or unwholesome diet, and a residence in a close, damp situation. It is indicated by a tendency to ecchymosis upon slight pressure, dropsy, painful swelling around the joints, as well as the occurrence of spontaneous hemorrhage from the umbilicus a few days after birth, or from the nose or gums in youths, or from the urinary passages in advanced life. Death may occur at any period of life, from hemorrhage, from the most trifling wounds, laceration, falls, extraction of teeth, or rupture of large vessels.

Prognosis.—The prognosis is usually favorable, excepting when it occurs in a serous cavity, or in scorbutic constitutions.

Treatment.—The indications of treatment are to arrest the discharges, and remove the constitutional hemorrhagic cachexia, if it exists. To control all forms of hemorrhage, the patient should be kept quiet, and his room well ventilated. If the hemorrhage be of an active character, as that which follows parturition, the rupture of large vessels, etc., ligatures should be immediately placed around the arms near the shoulder, and the thighs. The ligature should be sufficiently tight to prevent the return of venous blood, but not to obstruct the arterial circulation. In this way, much blood may be preserved in the extremities, and the force of circulation to the site of the hemorrhage materially retarded. The applications of the ligatures are only beneficial when hemorrhage occurs from other portions of the body, as the lungs, uterus, etc. Ice is a favorite remedy, and may be successfully employed externally as a topical application, or internally when the hemorrhage is connected with plethora, or asthenic state of the system. Gallic acid, aromatic sulphuric acid, ammonia, sulphate of iron, acetate of lead, oil of turpentine, ergot of rye, oil of erigeron, philadelphicum, matico, or piper angustifolium, geranin, trillin, quercus alba, and quercus rubra, lycopin and lycopus virginica, and many other astringents, are recommended and successfully used in various forms of hemorrhage. Among the most reliable are geranin, matico, lycopin, and oil of erigeron. Active stimulants are also used, and so far as our experience goes, there is no more reliable remedy than a good article of capsicum. We have been in the habit of relying upon this remedy for many years, and in all cases of uterine epistaxis, and hemoptysis, I have found it almost a specific. We

usually give from ten to twenty grains as a dose. Nauseants are also frequently resorted to with great advantage in hemorrhage. Tannin, alum, and hot water, have also been used. Formerly, bleeding was extensively practised as an anti-hemorrhagic remedy, but modern practice has discarded the lancet.

EPISTAXIS.

Epistaxis is probably the most frequent variety of hemorrhage. When occurring in childhood and youth, it is an idiopathic affection, dependent upon active congestion, but in advanced life, it is symptomatic. If there be a tendency to apoplexy, or a cardiac affection, epistaxis may prove beneficial; but when it occurs during the progress of diseases which deteriorate the blood, as in fever, purpura, scorbutus, etc., it is an alarming symptom.

Symptoms.— The premonitory symptoms are a sense of weight in the temples, pain in the head, throbbing of the carotids, a flushed face, vertigo, tinnitus aurium, a tickling or stinging sensation in the nose, and in weak and debilitated constitutions, chills, cold extremities, a small corded and quick pulse, and a shrunken condition of the cutis. Usually, the blood flows gutta et gutta, or a portion of it may pass along the posterior nares to the fauces, and be discharged through the mouth. Generally, but a few ounces are lost, but when the flow is profuse and protracted, pallor, syncope, debility, exhaustion and death may ensue.

The hemorrhage seldom occurs from both nostrils.

Causes.—Epistaxis may be caused by direct violence, a preternatural determination of blood to the head or Schneiderian membrand, organic cardiac affections, suppression of menstruation, or the hemorrhoidal discharge, as well as by polypus.

Treatment.—The cause should be removed, and cold water or ice directly applied over the nose. Plugging the nostrils with tannin, matico, or perchloride of iron, has been resorted to beneficially. Sometimes injecting ice water into the nostrils, or some active astringent, may answer the purpose. Hot mustard pediluvia and dorsal sinapisms have been used with success. The inhalation of lycoperdon or puff-ball is also a valuable remedy. The internal remedies must depend altogether upon the constitutional condition with which this affection is connected.

STOMATORRHAGIA.

Stomatorrhagia, or discharges of blood from the mouth and throat, occurs much less frequently than epistaxis. It seldom gives rise to any trouble, excepting when occurring during the last stages of scurvy or purpura, or after the excessive use of mercury. Fatal cases, however, are recorded, resulting from the extraction of a tooth, and the division of the frænum of the tongue.

The symptoms are too obvious to require enumeration. Usually, very little difficulty attends the diagnosis. If there be copious hemorrhage into the fauces, the effused fluid maybe swallowed, or fall upon the glottis, thus provoking vomiting or coughing of blood, resembling hæmoptysis or hæmatemesis; but by a careful examination of the mouth, as well as by noting the absence of all signs of gastric and pectoral diseases, these cases can be readily detected. In some few instances, the small veins about the inside of the cheek and pharynx become varicose, and should their walls rupture, severe or fatal hemorrhage may result. Ulcers about the tongue and fauces rarely bleed profusely, but occasionally glossitis, terminating in gangrene, has produced hemorrhage.

Causes.—It may proceed from wounds of the mouth, either by the teeth, blows, surgical operations, or other external violence. It may also be produced by inflammation and ulceration of the mouth. The constitutional predisposition to hemorrhage, frequently shows itself in the form of stomatorrhagia; the mouth, and especially the gums, bleeding profusely from the slightest wound, or even without any bruise.

In a case which occurred in Dr. Condie's practice, the blood flowed from the mouth in a stream; and on the gums being wiped with a sponge, "it was seen to start up at every pore, from the whole surface." In this, case as well as in all others, there is simply an exudation of serum, colored by the red matters of the dissolved or ruptured blood-corpuscles.

Treatment.—The treatment of this disease is similar to that of other forms of hemorrhage, and must depend upon the condition of the patient. The application of such remedies as are referred to under the head of hemorrhages generally, will usually control the

urgent symptoms. When it occurs from the extraction of a tooth, a drop of creasote upon a pledget of lint forced into the cavity, is usually an effectual remedy.

HÆMOPTYSIS.

By hæmoptysis we understand expectoration of blood. It may occur from the mucous surface of the bronchial tubes, by extravasation of blood into the pulmonary tissue, &c., or from the corrosion of a blood-vessel on the wall of a tuberculous vomica. It is also said to occur from the granulated surfaces in phthisis. The most common cause of the disease in females, when it occurs from the mucous surface of the bronchi, is vicarious menstruation, which takes place about the period of the catamenia. In these cases, for some time previous to the attack, there will be observed a diminution in the catamenia, accompanied by anæmia. Indeed, we have reason to suspect that, in connection with the catamenial derangement, there is tuberculous affection of the lungs. I do not recollect, out of a large number of cases, a single exception, and in quite a number of instances, it has terminated in acute phthisis. When the blood escapes from the bronchial mucous surface, it may be detected by the bubbling liquid rhonchus in the bronchi. The discharge is generally preceded by more or less constitutional disturbance, such as constipated bowels, furred tongue, and cough, which is often persistent, and accompanied with great dyspnœa. When it occurs from the rupture of corroded blood-vessels, the premonitory symptoms are quite obscure, and the discharge of blood very sudden, with violent cough and dyspnœa. The physical sign is the mucous *râle*. When it occurs from the granulated surface of the pulmonary tissue, or from pulmonary apoplexy, a correct diagnosis of the case may be made from its previous history, together with the rational and physical signs. The general symptoms of hæmoptysis are dulness, cold extremities, followed by flushes of heat, and red cheeks. The discharge from the lungs is attended with dyspnœa, pain and oppression of the præcordia, a sense of rawness in the throat, and a sweetish taste in the mouth. The expectoration consists of bright, frothy, or black and clotted blood, sometimes mixed with mucus. Says Laënnec: "When the

hemorrhage is very great, it comes on with a moderate degree of cough, and is accompanied with a convulsive elevation of the diaphragm like that which takes place in vomiting. Auscultation furnishes us with two signs of pulmonary apoplexy, absence of the natural respiratory sound over a circumscribed space, and crepitant *râle* around it.

Treatment.—When this disease is dependent upon derangement of the catamenia, the feet should be placed in warm water, hot sinapisms applied to the back and lower portions of the bowels, and from five to ten grains of pulverized matico given every fifteen or twenty minutes, until the hemorrhage ceases. Or, put one dram of the oil of erigeron in a pint bottle, fill it with hot water, and cause the patient to inhale the vapor. Either of these remedies will arrest the hemorrhage. Or, in the absence of other remedies, a teaspoonful of a strong solution of salt and water, taken every five or ten minutes, will frequently prove effectual. As soon as this symptom is removed, the patient should be put upon a treatment as directed under the head of irregularities of the catamenia. When hemorrhage occurs from the rupture of large vessels, ligatures should be applied to the legs and arms, and the patient caused to inhale a strong vapor of the oil of erigeron, and at the same time from five to ten grains of matico should be given every fifteen or twenty minutes, until it is arrested. During the active hemorrhage, the ligatures should be so adjusted as to retain the main volume of blood in the extremities, which should only be allowed to return by degrees after the bleeding has ceased.

As this form of hæmoptysis is always connected with phthisis, the patient should be treated accordingly. If it arise from pulmonary apoplexy, the ligatures should be used as in the other case. A hot sinapism should be applied to the chest, and the surface thoroughly bathed in hot whisky and capsicum, for the purpose of diverting the blood from the deep capillaries of the lungs to the superficial ones. Also, administer the matico, with small doses of lobelia and capsicum, every fifteen or twenty minutes. The bowels should be moved by a stimulating injection, and the patient allowed to hold ice in his mouth.

As soon as the hemorrhage ceases, the circulation should be controlled by the use of aconite. As this form of hæmoptysis is con-

nected not only with phthisis, but also with pneumonia and scurvy, the primary cause of the affection should be treated according to the nature of the case, and the condition of the patient.

HÆMATEMESIS.

Hæmatemesis, strictly speaking, signifies vomiting of blood; but employed in its technical sense, it denotes hemorrhage from the stomach. The blood is usually vomited profusely, is sometimes mixed with food, is not frothy, and may present a dark color from admixture with the hydrochloric acid of the gastric juice. Hence, it presents marked differences from the blood characteristic of hemorrhage from the pulmonary organs, which is coughed up in mouthfuls at a time, besides being frothy, of a florid red color, and mixed with sputa.

In simple ulceration, the blood is generally vomited in small quantities, and frequently after a meal, though sometimes a large vessel is laid open, and fatal hemorrhage ensues. The hemorrhage is also usually slight in ulceration of a cancerous mass. When from any cause, the extravasation is moderate, the vomited matters resemble *coffee grounds*.

Symptoms.—The premonitory symptoms of hæmatemesis are a sense of weight, fulness, heat, and pressure in the epigastrium and hypochondrium, a capricious appetite, rigors, faintness, anxiety, vertigo, a small and irregular pulse, adynamic palpitation, cold extremities, pallor of the countenance, and constriction about the breast. The hemorrhage commonly produces great depression, owing to the alarm, and the quantity of blood lost. In some cases, however, vomiting is not produced, and the blood passing along the intestines is voided per anum, or a portion may be vomited, and the remainder expelled with the fæces. When the intestinal evacuations contain blood, whether it come from the vessels of the stomach, or only from those of the intestines, the patient is said to be suffering from melæna, in which case the discharges are frequently black, and often resemble ink, mixed with sand. In some instances, however, they are more of a sanguineous character. This dark appearance, however, is by no means constant, and does not exist when the blood flows too profusely to be acted upon by the intestinal juices.

Occasionally, the disease is so general as to give rise to a san-

guineous cholera. Occasionally, it is confined to the bowels, the stomach not participating in it, in which case it is a more alarming symptom.

Causes.—Hæmatemesis may occur from any cause, capable of producing congestion, irritation, inflammation, or ulceration of the gastric mucous membrane, such as blows on the epigastrium, acrid substances swallowed, alcoholic liquors, gluttony, tobacco, mercury, fits of anger, etc. It may result from an insufficient or injurious diet, impure air, want of cleanliness, excessive venery, etc. It may arise from aneurism of one of the abdominal vessels, the sac communicating with the bowels, or from changes in the blood itself, as in scurvy, etc. Cirrhosis of the liver, or any disease which produces obstruction of the portal system, necessarily gives rise to congestion of the gastric and intestinal veins. The most direct cause, however, of hæmatemesis, is either passive congestion of the walls of the stomach, or simple or malignant ulceration. It most frequently attacks women, particularly those who are of a plethoric habit, and at times when there is a suppression of the catamenia.

Anatomical Characters.—The mucous membrane of the stomach, upon dissection, usually exhibits signs of inflammation or congestion, being reddened, and sometimes softened, or covered with dark spots, or else ulcerated. If the hemorrhage result from any organic affection, the lesion will be presented; or if proceeding from an accidental wound of a vessel, it may be discovered.

Prognosis.—When the cause can be removed, if the hemorrhage be not copious, or frequently repeated, the prognosis is not very unfavorable. But when it depends upon some organic lesion, death may occur suddenly from gastric hemorrhage, without the ejection of any blood by vomiting.

Treatment. — When hæmatemesis is associated with gastric fevers, one-fourth of a grain of nitrate of silver, administered in a liberal quantity of gum arabic mucilage, will usually arrest the difficulty. If associated with cirrhosis, perchloride of iron, and ice, taken in liberal quantities, will arrest the discharge. Quinine, iron, and capsicum, when the disease is connected with malarial fevers, is a most prompt remedy. Ice, applied to the epigastrium, has also been successfully employed. In all cases, a recumbent position, absence of all solid food, and rest, should be strictly enjoined.

MELÆNA, OR HEMORRHAGE OF THE BOWELS.

Hemorrhage of the bowels, when it occurs as an original functional disease, usually assumes the form of melæna, the blood having a black appearance, characteristic of that affection, by changes in the blood before or after extravasation. The name melæna, is improperly employed, as, in its most extensive sense, it includes all black discharges from the bowels, whether of altered blood, or vitiated bile; and if applied to hemorrhage alone, it is inadequate, as there are many instances of intestinal hemorrhage, in which the discharges are not black.

Symptoms.—The evacuation of blood in intestinal hemorrhage is usually preceded by symptoms of some well-known disease, such as enteritis, dysentery, enteric fever, scurvy, purpura, &c.; but often by those less definite, as oppression in the abdomen, pains in the hypochondriac region, a furred tongue, disordered appetite, constipation or diarrhœa, sallow or dingy complexion, dejection of spirits, languor, and more or less disturbance of the circulation, indicating visceral disorder and impaired digestion. The patient is suddenly attacked with griping pain, nausea, increased paleness, depression of the pulse, coolness of the extremities, attended by an offensive discharge of black-colored blood from the bowels. In some instances, the diarrhœa, with part or all of the same symptoms, may continue for several days without the hemorrhage being noticed; but in others, it may be the first obvious sign of the disease, in which case there is sometimes extreme depression, which may prove fatal. There may be no evacuations, and sudden death occur from intestinal hemorrhage, which may be suspected if there have been previous partial congestion or organic disease of the bowels, and if tumefaction, with dulness on percussion, be discovered, which did not before exist. The quantity and quality of the blood are various; the former, in some instances, being very small, and in others amounting to pints, or even quarts. The color is sometimes bright red, but often very dark. In consistence, it may be fluid, grumous, or tar-like. It may be pure or mixed with bile or intestinal secretions. The character of the disease may often be determined by the color of the evacuations; as the blood coming

from the large intestines is usually of a bright red color, and that from the small intestines, dark red, copious, and pure. If issuing from membrane, disorganized by inflammation, or malignant ulceration, as in fevers and cancer of the bowels, it has the appearance of coffee-grounds. If there is a small discharge of bright blood, mixed with mucus, active inflammation, as in dysentery, may be suspected; and when the evacuation is black and tary, with both a red and bilious tinge, it may have come from the liver.

The course of this disease is uncertain. It may prove fatal, but rarely, unless complicated with serious organic derangement of the bowels, or other viscera, though after a cure, predisposition may lead to a return.

Diagnosis.—It is not always easy to decide, in case of bloody evacuations from the bowels, whether intestinal hemorrhage really exists or not. Discharges of dark and altered blood are often a mere attendant upon hæmatemesis, and may be the result of it even when there is no vomiting, or they may be derived directly from the mucous membrane, and there still be vomiting of blood, as the causes of hæmatemesis act with nearly as much energy upon the bowels as on the stomach; or vomiting and purging may both exist, though the seat of the hemorrhage be in the bowels exclusively. In deciding whether the stomach or bowels be the source of the hemorrhage, we must judge according as the symptoms point more directly to one than the other, or as they embrace both. Hemorrhage may be distinguished from bile by diluting them, or by adding common salt, in either of which the blood will assume its proper red, and the bile its yellow hue. True, melænotic matter may be mistaken for hemorrhage, but may be distinguished by its wanting the redness of blood.

Causes.—Whatever is capable of producing irritation, congestion, inflammation, or ulceration of the intestinal mucous membrane, may occasion this form of hemorrhage. In cases of predisposition, drastic cathartics are liable to bring on an attack. Inflammation and ulceration of the mucous coat, cancers, aneurisms, organic diseases of the heart, suppression of the menses, malignant fevers, purpura, and scurvy, are all occasionally attended with hemorrhage from the bowels.

Treatment.—After having discovered the nature and character

of the hemorrhage, it may be necessary to relieve the discharge at once. If it occur from the mucous membrane, either as the result of exudation from the weakened capillaries, or from the rupture of large vessels, as in cases of ulceration, cancers, and other affections of the bowels, it may usually be controlled by injecting into the bowels a strong decoction of matico. This should be done by inserting a long catheter, and pumping through it from one to two pints of the decoction, while the patient is lying with his hips slightly elevated.

If this should not control the hemorrhage, take tannin, geranin, and trillin, of each one dram; thick mucilage of gum arabic, six ounces. Rub well together, and inject the bowels as directed above. If this should fail after a proper trial, the patient should be put under the influence of the nitrate of silver pill, as directed under the head of typhoid fever. After having arrested the hemorrhage, the treatment should be such as will remove the cause of the difficulty. When the hemorrhage is active, and followed by great prostration, the ligatures should be applied, and so adjusted as to prevent the excessive loss of blood.

HÆMATURIA.

Hæmaturia, or hemorrhage from the urinary organs, may proceed from the kidneys, ureters, bladder, or urethra.

Symptoms.—It is usually preceded by a sense of fulness, heat, and pain in the region of the urinary apparatus, succeeded frequently by symptoms similar to those of dysury, as faintness, a bearing down sensation, pain at the neck of the bladder, ardor urinæ, and a disposition to micturate. Urine containing blood in comparatively small quantity will be found of a dark brown color, owing to the action of its acid on the hematine. It may also be loaded with albumen. A peculiar form of hæmaturia, probably due to the distoma hæmatobium, is occasionally met with in Egypt, Southern Africa, and the Mauritius Islands. The eggs of this parasite may be observed in the urine, and occasionally, the perfect entozoon be discovered.

Diagnosis.—When the patient is laboring under no constitutional disease, that is usually accompanied by hemorrhage, or has not been affected with calculous affections, if he complains of pain in

the urinary organs, and voids blood with the urine, mixed with mucus, and especially if combined with purulent matter, a breach of surface must exist somewhere in the urinary apparatus. Having ascertained the cause of the hemorrhage, its seat should be sought. When there are sharp twisting pains along the line of the ureters, darting to the urethra and testicles, accompanied with nausea and vomiting, it may be reasonably supposed that it depends upon the presence of calculus in the ureter or kidneys. On the other hand, when the hemorrhage comes on after exercise, and there is occasional retention, accompanied by a twinging pain in the penis, there can be but little doubt that the hemorrhage is caused by stone in the bladder. The distinction of renal from vesical hemorrhage is important. If the hemorrhage be from the kidneys, the blood is equally diffused throughout the whole urine. The expulsion of slender, cylindrical pieces of fibrin, which have evidently been moulded in the ureter, is also an important characteristic. Upon microscopical examination, the urine is found to contain casts of the renal tubes formed of coagulated blood.

When the hemorrhage is from the bladder, the greater part of the blood is voided at the close of micturition, the first urine having flowed nearly pure; and the blood corpuscles are observed mixed with the flat scaly vesical epithelium, and the urine contains more or less muco-purulent matter. In case of extensive hemorrhage from the bladder, large coagula may form within it, and render an entire obstruction to the passage of urine. This can be detected by introducing a catheter, and breaking up the coagulum.

Causes.—It frequently occurs in certain malignant epidemics, as cholera, and severe remittent and typhoid fever, in which the spleen and liver are implicated. It may also arise from malignant diseases of the kidneys or bladder. Irritating medicines, as cantharides, or oil of turpentine, may produce it, or it may occur during the course of rheumatic fever, pneumonitis, malignant variola, scurvy, purpura, continued fevers, etc. When the hemorrhage cannot be traced to some constitutional disturbance, it may be considered directly mechanical. This may depend upon a calculus, either causing irritation or wounding some blood-vessel; or the hemorrhage may occur from ulceration of the bladder, by the irritating effect of the urine itself. Blows, falls, violent horse-back exercise,

or the jolting of a rough carriage, venereal excesses, violence in severe or protracted labors, vascular or varicose tumors in the bladder, drastic purges, translation of arthritis or rheumatism, morbid condition of the blood, as anæmia, plethora, or suppression of the menstrual or hemorrhoidal discharges may give rise to it. It is more common in men than women, and in adults than children.

Treatment.—The treatment of hæmaturia will depend upon the cause, the degree, and the locality.

When the disease is dependent upon scurvy or purpura, it should be treated as directed under that head, with the addition of astringents, such as an injection of a weak solution of matico into the bladder, and the oil of erigeron taken internally. If occurring as the effect of obstruction of the liver and spleen, give the following:—Take muriated tincture of iron, two drams; quinine, twenty grains; water, three drams; mix, and give one tablespoonful every four or five hours, until the active stage of the disease is passed. After which, the following mixture:—Take gin, one pint; sugar, one pound; water, one pint; aletrin, one dram; euonymin, two drams; mix, and give one tablespoonful three or four times a day. The region of the liver and spleen should be bathed two or three times a day in a liniment composed of sweet oil and spirits of turpentine. When hæmaturia is connected with a gouty diathesis, a free purgative of podophyllin and cream of tartar may be given in the commencement of the treatment, followed by full doses of the oil of erigeron, until the hemorrhage ceases. After which, nitro-muriatic acid and euonymin, should be given. If calculus in the kidneys is the cause of the disease, a strong decoction of the queen of the meadow, will dislodge it and arrest the hemorrhage; after which, mucilaginous diuretics should be given, such as marshmellow, flaxseed, etc. When the cause of hæmaturia is seated in the bladder, it should be injected first with warm water, afterwards with a strong solution of matico, mixed with starch-water. The back and loins should be thoroughly bathed in a liniment prepared as follows:—Take oil of capsicum, ten drops; alcohol, one-half pint; oil of origanum, three drams; mix, and use as heretofore directed. If there is much inflammation of the bladder, scarify and cup over that region, and apply hot packs. At the same time give aconite or veratrum, until the symptoms are controlled. If the

bladder should become distended with a large amount of coagulated blood, recourse must be had to a large-sized catheter; and by the aid of an exhausting syringe, and an occasional injection of the bladder with cold water, the coagula may be removed. Should the hemorrhage become active while thus evacuating the bladder, it may be arrested by injecting a solution of matico into the rectum.

MENORRHAGIA.

Uterine hemorrhage is a symptom of various affections, but in the present article we will only consider it as applied to cases of increased menstrual discharge, though frequently it is employed to denote any sanguineous flow from the uterus, excepting that of the regular menstrual period. It usually takes place from the lining mucous membrane, and either in an unimpregnated or impregnated state of the organ.

Causes.—Menorrhagia may be produced by a plethoric or anæmic condition, resulting from unwholesome food, impure air, exposure to cold, filth, dampness, stimulating food and drink, sedentary habits, hot rooms, etc. Tuberculosis, splenic affections, granular degeneration of the kidneys, anæmia from prolonged lactation, etc., may, by producing attenuation of the blood, abnormally increase menstruation. Excessive congestion of the ovary and uterus during the maturation and escape of the ovule, is a frequent cause. Excessive sexual indulgence, abortions, constipation, obstructions of the portal circulation, leucorrhœa, pregnancy, delivery, etc., may produce the same result, by causing congestion, irritation, or a determination of blood to the uterus. The organic diseases which give rise to it, are cancer, fibrous tumors, or polypi, inflammation of the cervex, and the presence of moles in the uterine cavity.

Symptoms.—The premonitory symptoms of menorrhagia, or metrorrhagia, are a sense of weight, fulness, heat and pain in the region of the uterus, pain in the loins, more or less bearing down, slight swelling of the breasts, impaired digestion, cephalalgia, tinnitus aurium, an irregular pulse, rigors and flashes of heat. In the course of a few days, the hemorrhage occurs, which may be so profuse as to produce great prostration and syncope. Usually, however, it is at first moderate. If the hemorrhage occurs at the

menstrual period, it usually has the appearance and properties of the catamenia. Menstruation may occur quite regularly, but near its proper time for cessation, there is a sudden or gradual supervention of the hemorrhage, the blood coagulating, and the flow being attended with all the usual symptoms of uterine hemorrhage, as it occurs disconnected with menstruation.

Those subject to hemorrhagia are less liable to become pregnant, and are in danger of its return any time during the period of conception. It may occur at or immediately after delivery, in which case, it is attended by faintness, cold extremities, and unless arrested, fatal prostration. When appearing after the cessation of the menses, the symptoms are similar to those above enumerated, with the addition of nervous or hysterical phenomena.

Treatment.—When arising as the result of miscarriages, moles, or uterine polypi, it can be promptly arrested by a supine position, rest, and the administration of two or three grains of capsicum, and from one-half to one grain of opium, every two or three hours. As soon as the hemorrhage is arrested, its cause should be removed. If arising from congestion of the ovaries, or of the mucous membrane of the uterus, from one-fourth to one-half grain of hamamelin should be given every half hour, or hour. If following parturition, ten drops of the oil of erigeron should be given every ten or fifteen minutes. When associated with malignant diseases, such as scurvy, typhus fever, etc., a thorough constitutional treatment, in addition to the local, should be instituted. Astringent injections into the vagina, such as tannin, geranin, alum, nitrate of silver, perchloride of iron, etc., may also be resorted to in urgent cases. Ice applied to the epigastrium, and to the uterus and vagina, by means of the tampon, has also been successful in some cases. Trillin, in combination with carbonate of iron, in the proportion of one grain of the former to two of the latter, administered every two or three hours, is a very successful treatment, when the disease arises from anæmia, or a scrofulous or feeble constitution.

CUTANEOUS HEMORRHAGE.

Cutaneous hemorrhage, with the cuticle entire, has in some rare instances escaped from large portions of the surface, like perspiration, but usually the discharge is limited to a small space, as the

soles of the feet, palms of the hands, roots of the nails, nipple, navel, arm pits, front of the chest and groins. The cutis vera may appear quite healthy, or red, as if congested or inflamed.

Cause.—It results from violent muscular exertion, or straining, strong mental emotions, etc. It may be vicarious to other discharges, particularly the catamenia, in which case, it may appear periodically. Women are more liable to this form of hemorrhage than men.

Hemorrhage beneath the cuticle, and in a morbid state of the skin, is quite frequent. A flow of blood from blisters, ulcers, or scratches, often occurs in persons of a hemorrhagic diathesis. In depraved conditions of the blood, effusions in the cutis, in the form of petechiæ, and beneath the cuticle in the form of bloody blisters, are common attendants.

Treatment.—This form of hemorrhage usually originates from a vitiated constitution, and should be treated by mineral acids, cod liver oil, iron, baths, out-door exercise, fresh air, and a generous diet.

HEMORRHAGE FROM THE SEROUS MEMBRANES.

Hemorrhage from the serous membranes may result from inflammations, the bursting of aneurisms, or the erosion and rupture of blood-vessels. It may produce fatal syncope, but manifests its effects more frequently by compressing the neighboring vital organs, or by causing inflammation in the membrane. The diagnosis is sometimes obscure, the affection being first discovered after death. When great prostration, and acute symptoms of anæmia occur very suddenly, together with a derangement of any organ invested by a serous membrane, it may be suspected, if no sufficient disease previously existed, to explain these results. Percussion or auscultation may reveal a fluid in a serous cavity, which confirms the diagnosis. It should also be remembered, that when there is hemorrhage from a serous membrane, independently of organic disease, there is simultaneously hemorrhage from a neighboring mucous surface. Hemorrhage of the pleura is one of the most frequent serous hemorrhages, characterized by shortness of breath, great prostration, faintness, bloody expectoration, and the presence of blood within the pleura. When blood is effused into the peri-

cardium, it is usually owing to rupture of the heart or one of the great vessels. Cases, however, are recorded in which it appeared to result from transudation. The symptoms of effusion of blood into the *peritoneum* are sudden and intense abdominal pains, nausea and vomiting, coldness of the surface, extreme feebleness of the pulse, a haggard countenance, and delirium.

The phenomena and effects of hemorrhage of the *arachnoid* membrane, will be considered under apoplexy. Hemorrhages occurring in the *tunica vaginalis testis*, and *synovial membranes*, are usually owing to violence, though they may result from transudation in persons of a strong hemorrhagic diathesis.

Treatment.—The patient should be placed on his back, strict rest enjoined, and three or four grains of capsicum, and one of opium administered. If the hemorrhage occurs as the result of transudation into the pleura, or peritoneum, absorption may possibly occur, which may be aided by proper constitutional treatment.

HEMORRHAGE OF THE CELLULAR AND PARENCHYMATOUS TISSUES.

Extravasation of blood into the cellular tissue may occur in any portion, and is among the most constant phenomena of scurvy, purpura, and malignant fevers. It occurs beneath the skin, forming ecchymoses; beneath mucous and serous membranes, producing red patches; and among the muscles, giving rise to tumors. If the patient recovers from the disease in which this symptom originates, the blood will either be absorbed, or become organized, and form new structure, which finally disappears. It is a frequent result of external violence, and is produced by the slightest causes in persons of a strong hemorrhagic tendency.

Hemorrhage into parenchymatous tissues, results from inflammatory or other organic lesions, external violence, and transudation. Its existence is usually not known in most of the organs until after death. It produces its injurious effects by interfering with their functions, rather than the mere loss of blood. When occurring in the brain, apoplexy or palsy may result from it; and when in the lungs, pulmonary apoplexy.

The treatment of these forms of hemorrhage, are considered under their respective heads.

DROPSY.

Dropsy, or hydrops, is an abnormal accumulation of watery or serous liquids, derived from the blood, occurring either in the cellular or areolar tissues, or else within serous cavities. The pathological feature is, that the liquid which escapes through the coats of the vessels is not liquor sanguinis, but water containing more or less of the constituents of blood-serum. Metamorphoses or developments result from the coagulation of fibrin, or lymph, produced by the escape of the liquor sanguinis, or blood plasma; exudations consist of the effused products which solidify by coagulation, and become the seat of adventitious tissues, pus-globules, etc.; while, on the other hand, liquid effusions, devoid of coagulating material, undergoing no metamorphoses, and not giving rise to blastema or cytoblastema, if retained, constitute dropsies. A true dropsy is not the effect of inflammation. In a dropsical accumulation, the liquid is generally clear, like the serum of the blood, and no solid fibrin or lymph is apparent, while in inflammatory effusions, the liquid is turbid from the admixture of lymph, and contains more or less solid fibrin. Dropsical effusions have an alkaline reaction, contain more or less albumen, and are occasionally red, from the presence of blood-pigment, or yellowish or greenish, from bile-pigment. Fatty matter may render the liquid opalescent, or milky. Urea, and various saline constituents, are also occasionally observed.

In order to understand the origin of dropsy, it must be borne in mind that the processes of exhalation and absorption are constantly occurring from all the surfaces of the healthy body, so that when they are properly balanced, the surfaces will merely be kept moist. Now, if from some cause this balance be disturbed, dropsy must necessarily result. It is probable that the process of absorption takes place by the lymphatics, which remove the worn out particles of the body; by the lacteals, which take up the chyle from the alimentary canal; and by the veins, which imbibe the fluid exhaled from serous membranes. In dropsy, the veins and their capillaries are the seat of disease, and it often happens that, owing to conges-

tion, these vessels are not only unable to take up more fluid, but, when much distended, the watery portion of the blood transudes through their coats. The process by which this result takes place can easily be explained on the principles of endosmosis and exosmosis.

Dropsy receives different names, according to its situation. When occurring in the serous membranes, the term *hydro* is prefixed to the membrane; when applied to effusions into the areolar tissue of internal organs, as well as beneath the integument, it is styled *œdema;* and when subcutaneous œdema extends generally over the body, *anasarca.* Dropsy never occurs as a primary affection, but is a symptom of disease, resulting from increased pressure from an accumulation of blood in the veins, and a diminution of the density of the blood serum. When arising from defective absorption, it is styled *chronic,* or *passive;* when from excessive exhalation of serous fluid, *active,* or *acute.*

Symptoms.—In active dropsy, there may be a frequent, full, and active pulse, a flushed or healthy appearance of the countenance, considerable muscular strength, and a tolerable condition of the digestive and assimilative functions. In *passive* cases, there is pallor of the countenance, coldness of the extremities, a feeble pulse, relaxation and weakness of the muscles, and a general anæmic condition, with more or less derangement of the digestive, assimilative, and sanguiferous functions. In both these conditions combined, there may be deficient respiration, constipation, thirst, scanty urine, or if in renal cases, albuminuria, and a dry, rough state of the skin. In cases of spontaneous cure, the removal of the fluid is accompanied by profuse perspiration, diuresis, or diarrhœa. Effusion within the cranium causes convulsions, coma, paralysis, and apoplexy; when within the thorax, it impedes the action of the heart and lungs, while œdema of the extremities may produce inflammation and gangrene. In many cases of general dropsy, both the heart and kidneys are affected. Death may ensue from the dropsy, or from some intercurrent inflammatory affection, or from the organic disease itself.

Causes.—The causes of dropsy are those inducing congestion or irritation of secreting tissues, as cold, the retrocession of cutaneous eruptions, the metastasis of gout or rheumatism, etc.; those weak-

ening or impoverishing the blood, as insufficient food, exposure to damp, cold or impure air, insufficient clothing, impaired digestion, defective sanguification, the use of tobacco, sexual excesses, alcoholic drinks, loss of blood, and a variety of exhausting diseases, as phthisis, scrofula, malaria, scurvy, etc.; and those which obstruct the circulation, and produce venous congestion, as abdominal tumors, obliteration of the veins, and organic diseases of the heart, liver, spleen, lungs, kidneys, and lymphatics.

Prognosis.—When no organic diseases occur, a cure can be frequently effected.

Treatment.—The treatment of general dropsy, must essentially depend upon the condition of the system under which it manifests itself. There are a few general remedies, however, that are indicated in nearly all dropsical affections. We refer to barosmin, eupurpurin, aletrin, apocynin, acetate of potash, bitartrate of potash, elaterium, and ampelopsis quinquefolia. The object of these remedies, is to evacuate the fluid by the kidneys and bowels, which, when not successful, may be aided by proper surgical manipulations. The causes upon which the dropsy depends, should also receive proper attention. For the particular treatment, see the different forms of dropsy.

ANASARCA.

Anasarca consists of a general subcutaneous œdema, extending over the body. It, like other forms of dropsy, may be of an active or passive character. In cases of anasarca, there may only be a slightly increased action of the circulatory system, or a hard, full, and frequent pulse. The countenance usually assumes a pale appearance, though it may be almost natural, or even flushed. In the passive variety, there is pallor of the countenance, a weak and feeble pulse, cold extremities, and a general anæmic and debilitated condition of the system. The anasarcous swelling generally commences in the feet and limbs, and then gradually extends over the whole body; but in some active forms, and particularly when occurring from pneumonia, it is first observed in the face. It may be distinguished from all other forms of swelling, by its pale appearpearance, and by its pitting on pressure.

Causes.—The most frequent causes of anasarca, are suppression of the perspiration from cold, repelled cutaneous eruptions, diseases

of the skin, heart, liver or kidneys, anæmia, relaxation of the tissues, etc.

Anatomical Characters.—The cellular tissue is found, after death, greatly distended. The subcutaneous tissue, and the substance of the muscles and viscera, may also present the same appearance. The latter are softened, pale, and disposed to speedy putrefaction. Occasionally the serum accumulates in the tissue subjacent to the mucous membranes, which are elevated, and may assume a jelly-like appearance.

Diagnosis.—The diagnosis of anasarca is rarely doubtful. There may occasionally be difficulty, for a time, in deciding whether the œdema of the feet and legs is merely local, or properly dropsical; but, in the latter case, the progress of the disease will usually settle all doubt. General emphysema may possibly be confounded with dropsy, but the crackling under the fingers, will sufficiently distinguish it.

Prognosis.—When the anasarca is extensive, and attended with effusion into the serous cavities, the prognosis is very unfavorable. When, however, the disease runs its course without any complication, a favorable issue may be anticipated.

Treatment.—In treating anasarca, the cause of the difficulty should be sought, and receive especial attention. The next object is to remove the dropsical accumulation. If the strength of the patient will bear it, a purge, consisting of one-eighth of a grain of elaterium, one-fourth of a grain of jalapin, and one dram of bi-tartrate of potassa should be given. If the first does not effect a full, watery evacuation from the bowels, it should be repeated in two or three hours. This should be followed by a thorough spirit sweat, and the use of diaphoretic teas, such as nepeta cataria, eupatorium purpureum, balm, etc. After maintaining a diaphoretic influence by these means, for several hours, an effort should be made to stimulate the renal secretions. It must be borne in mind, that while attempting to excite the kidneys, diaphoretics should not be used, as any excitement of the skin tends to lessen their action. The renal secretions can usually be augmented by drinking liberally of a decoction of equal parts of eupatorium purpureum, and ampelopsis quinquefolia. In some cases, by adding one dram of acetate of potash, to each pint of the decoction, the diuretic properties are much enhanced.

When there is extensive swelling of the extremities, bandages should be applied, and if there are ulcers, emollient poultices, moistened in a solution of sulphate of zinc. Dr. Wood recommends the puncturing of the limbs, for the purpose of allowing the fluid to escape. The strength of the patient should be well supported by a nutritious diet, and every possible means adopted to enrich the blood.

ASCITES.

Ascites is a frequent form of dropsy, characterized by a tense, swollen condition of the abdomen, owing to the presence of an effused fluid in the cavity of the serous membrane lining it.

Pathology.—The pathology of ascites has already been described in our article on dropsy. We might, however, add that the effused fluid is limpid, of a pale, yellow color, like urine, of an alkaline reaction, and frequently consisting of albumen. Marchand has shown the composition of this fluid to be as follows:

Water,	952.30
Albumen,	23.80
Urea,	4.20
Chloride of sodium,	8.10
Carbonate of soda,	2.10
Phosphate and sulphate of soda,	0.60
A visicid substance,	8.90
	1000.00

Causes.—The most frequent causes of ascites, are obstruction to the portal circulation, congestion, irritation, or inflammation of the peritoneum, and organic or functional diseases of the heart, liver, or kidneys. It may, however, be produced by indigestion from irregular eating, the use of intoxicating liquors, mercurials, amenorrhœa, chronic ague, and whatever causes an anæmic condition, with relaxation of the tissues.

Symptoms.—In this affection, the appearance of the patient is very characteristic. The upper portion of the body may be greatly emaciated, the features pinched, the countenance very anxious, while the abdomen is greatly distended. The latter phenomenon, together with more or less fluctuation, may be perceived by laying

the hand on one side of the abdomen, and at the same time gently rubbing the other side. The integuments have a shining appearance, while the superficial veins are generally dilated. This disease is mostly connected with anasarca. Pressure of the swollen parts with the finger, produces indentations, which may remain for some time. The swelling gradually extends to the trunk, arms, and the head. At this time, the breathing becomes difficult, there is dyspnœa, nausea, flatulency, colic-pains, constipation, a heavy and bloated countenance, a dry, dirty, and sallow appearance of the skin, dry cough, and a slow, irregular fever. The urine is usually scanty, high-colored, and loaded with lithates, while in ascites from cirrhosis, it generally contains bile, and in that from renal disease, an abundance of albumen. Auscultation shows that tubular breathing is heard in the inter-scapular regions, especially towards the left side; that the apex of the heart is elevated, and rather pressed to the left, and that the respiratory murmur is not heard as low as in health.

When these symptoms have continued for a longer or shorter time, the patient becomes weak and emaciated, loses all appetite, is restless at night, and suffers much from mental depression and nervousness. Associated with these symptoms, there is generally a deposition of tuberculous matter in the lungs, and hectic fever, and unless the progress of the disease be arrested by timely treatment, death will inevitably ensue.

Diagnosis.—When there is considerable effused fluid in the abdomen, a general fulness of this organ is readily detected, which is most prominent below the level of the umbilicus, when the patient is standing, but upon lying down, the abdomen will become more flat, while both flanks will bulge outwards. When there is excessive effusion, there is a general abdominal enlargement, uninfluenced by the posture assumed, the abdomen appears to encroach considerably on the thorax, and there will be much eversion of the xiphoid cartilage, with those of the lower ribs. Besides these signs, the sense of fluctuation arrests attention, the waves being finer, and following more or less quickly upon the impulse, in proportion as the distention is great, and the fluid serous, or of a watery consistence. The last sign, however, may be obscured, owing to œdema of the abdominal wall, or the presence of much fat. Per-

cussion elicits a well-marked resonance over the higher parts of the abdomen, owing to the floating of the intestines. This latter characteristic symptom distinguishes ascites from ovarian dropsy, in most cases; but if the distention be so extensive that the breadth of the mesentery is not sufficient to allow the intestines to reach the surface of the fluid, or the coils of the intestines are bound down by adhesions of coagulable lymph, dulness will result. Occasionally, too, resonance on percussion occurs in ovarian dropsy, after paracentesis, from the cyst filling with air, or from a communication forming between the cyst and the intestine, thus allowing the escape of flatus from the latter into the former.

Prognosis.—Ascites, resulting from organic disease, usually terminates fatally; but, under other circumstances, the danger is comparatively slight.

Treatment.—In the treatment of ascites, if the accumulation of fluid be extensive, it will probably be necessary to remove it by paracentesis abdominis. As soon as this has been accomplished, the cause of the difficulty should be sought, and, as far as possible, removed. As we have previously remarked, ascites is frequently associated with diseases of the liver, especially of the portal circle. This can usually be overcome by administering a purge of podophyllin, leontodin, and leptandrin. About one-half grain of podophyllin, and two grains of leontodin and leptandrin may be administered as a dose, and repeated until free evacuations follow. This may be succeeded by hot packs or irritating plaster, according to the character of the congestion. An alcoholic vapor bath will also contribute much in overcoming the hepatic and portal difficulty. After the tapping, gentle pressure has been highly recommended, and successfully applied in many cases. Lubricating the bowels two or three times a day with Mecca oil, followed by friction, has also been beneficially employed. An effort should also be made to divert the aqueous exudation, by exciting the kidneys. In one case of dropsy that came under my notice, after other means had failed, I successfully removed the difficulty by administering one dram of the pulverized leaves of the ampelopsis quinquefolia every two or three hours. Small doses of acetic acid, frequently repeated, have also been administered with entire success in several cases. A decoction of the dried tops of sarothamnus scoparius, or

common broom, drank freely, has a most direct influence upon the kidneys, and largely increases the discharges of water. Dr. Beach recommends the following:—Take juniper berries, mustard seed, and ginger root, of each one ounce; horse-radish and parsley root, of each two ounces; hard cider, four pints. Dose, a wine-glassful four or five times a day. One drop of Croton oil, triturated in one dram of sugar, and divided into twenty powders, and one given every two or three hours, has also been a valuable remedy in ascites.

OVARIAN DROPSY.

Ovarian dropsy consists in an accumulation of fluid in one or more cells within the ovary, or in a serous cyst connected with the uterine appendages. The pathology has been considerably elucidated by the researches of Hodgkin, Seymour, Bright, Cruveilhier, and Müller, from which it appears that the ovary may be the seat of a simple cyst; of a compound cyst formed of a capsule containing a number of secondary cysts, or of similar cysts more or less combined with a sarcomatous structure of a malignant character. The first of these are usually undetected until after death, in which case they are never observed larger than an orange. The latter two frequently attain an immense size, containing several gallons of fluid, constituting ovarian dropsy. Owing to the interference with the process of respiration from this effusion, paracentesis is frequently necessary, which operation is repeated again and again, at shorter intervals, until the patient dies, either from peritonitis, suppurative inflammation within the sac, or exhaustion. The serum may exist within the cavity of the abdomen, or be confined within the cystic tumor.

In all cases of ovarian tumors, the original form and structure of the ovary disappear. Whether the tumor has originated from the production of a new growth, or an enlargement of the Graafian vesicles, is not yet accurately determined. Hughes Bennett adopts the latter opinion, and states also that the external capsule is formed by the thickening and extension of the serous membrane which covers the organ. Sooner or later, however, the enlarged ovary consists of a dense fibrous envelope, or sac, containing numerous secondary cysts attached to its walls, containing a clear, glairy, or gelatinous fluid, and composed of a firm, fibrous capsule, lined by a

smooth membrane, covered with epithelial cells, which, as the tumor develops itself, become larger, more numerous, and crowded together. As the tumor enlarges, it ascends from the pelvis, and occupies more and more of the abdominal cavity, and may float loosely in a fluid within it, or form adhesions to the omentum, peritoneum, colon, or neighboring viscera.

Treatment.—Some ten or fifteen years ago, we published our experiments with the galvanic battery in ovarian dropsy. At that time we stated that we had successfully treated several cases by the use of that agent. Since then, we have very much extended our observations in its use in this form of dropsical affection, and are more than ever confirmed in its great utility, as we have treated a large number of cases with this agent; and although we have not cured all of them, we have succeeded in curing quite a number, and benefiting all the others. In some cases, we have been under the necessity of applying the battery for a long time, usually receiving but little benefit under six or eight months, and in several cases it has required two or three years to effect a cure. The best method of applying it is to pass the current through the tumors, from different directions, for half an hour or so, two or three times a day. The current should be as strong as the patient can bear it. In connection with electricity, we have been in the habit of administering an occasional hydragogue cathartic, and the use of diuretics. If the case should not yield, it may be put upon full doses of iodide of potassium. As much as twenty grains may be given every day, in connection with some diuretic mixture. Gentle pressure upon the tumor, by means of well-adjusted pads, also have a very favorable influence. In cases where the cysts has become very large, tapping may be necessary. In one case, that is now under my treatment, and which was considered entirely hopeless some four years ago, I have removed over eighty gallons of fluid, from ten different tappings; and by the use of the above treatment, she is now rapidly recovering, the demands for tapping being farther apart, with a far less quantity of fluid accumulating. The strength of the patient should be well supported, and exhausting purges sparingly used.

HYDROCEPHALUS.

Hydrocephalus, or dropsy of the brain, may be of an acute or chronic form; acute, when the result or precursor of tubercular meningitis; and chronic, when congenital, or when arising slowly from constitutional causes.

Pathology.—All circumstances, including scrofula, which weaken the general nutrition of the system, tend to produce languor, and obstruction of the cellular circulation. In young children, this defective nutrition is especially liable to produce congestions within the cranium, causing either simple or tubercular exudations, which occasion those softenings so frequently observed upon dissection.

Causes.—The active form may be produced by causes that favor congestion, irritation, or inflammation of the brain, or its membranes, such as constipation, intestinal worms, direct injuries of the brain, tuberculous deposition on the meninges, the extension of inflammation from the petrous portion of the temporal bone, etc. The chronic form is usually congenital or hereditary, resulting from a scrofulous or tuberculous inherited constitution, or it may be produced by exposure to cold, insufficient nourishment, dentition, impure air, blows, the use of tobacco, intoxicating liquors, masturbation, sexual excesses, etc. Occasionally it has occurred as a sequel to eruptive fevers, especially scarlatina and rubeola.

Symptoms.—The symptoms usually manifest themselves before the infant is six months old, in cases where they are not congenital. Although the child takes its food eagerly, it does not thrive, and in a few weeks, the marasmus becomes extreme. The intelligence may be unaffected, but often it is much enfeebled. There is great irritability and peevishness, a morbid susceptibility to noise and light, an epileptic tendency, great muscular weakness, a peculiar rolling movement of the eye-ball, strabismus, occasionally amaurosis, nausea, vomiting, constipation, with dark-colored, offensive stools, abdominal pains, cephalalgia, vertigo, grinding of the teeth during sleep, with frightful dreams, causing starting, jumping, and frantic screams. The head frequently droops helplessly on one side, owing to the muscles and vertebræ being too weak to maintain it in the erect position.

In the second stage, there is usually more stupor, great pallor, a slow pulse, dilatation or contraction of the pupils, while the little fingers are continually picking the nose and lips. When terminating fatally, excessive prostration sets in, the pulse becomes rapid, and paralysis, coma, and convulsions follow. If the disease, however, terminates favorably, the lethargy, pallor, and irritability gradually subside, a desire for food is evinced, the muscular power increases, and the emaciation is less marked.

The head attains a great size in this disease, the unossified sutures readily yielding to the pressure of the liquid. The bones are mostly thin and transparent, the membranes thickened, and one side of the cranium may be larger than the other. The serum is usually contained in the lateral ventricles, which are frequently expanded into one cavity, but occasionally it is collected in the arachnoid sac, in which case it may compress the brain to a remarkable extent. The quantity varies from two or three ounces to as many pints. Heberden has related an instance, in which there were no signs of dropsy during life, and yet eight ounces of fluid were observed in the ventricles upon dissection.

The children of intemperate, scrofulous, or syphilitic parents, are most likely to be sufferers from it. Although essentially an affection of childhood, yet it has affected adults; and, among others, Dean Swift suffered from it.

Diagnosis.—Hydrocephalus must not be confounded with spurious hydrocephalus, or *hydro-encephaloid* disease, which occurs in weakly children, producing heaviness of the head, drowsiness, languor, alarm at slight noises and at strangers, freaks of temper, irregular breathing, coolness of the surface, and unhealthy stools. The most characteristic phenomenon, however, is depression of the fontanelles, which are prominent in dropsy.

Treatment.—The irritating causes of this difficulty should be removed, and if a child, the nutrition should be attended to, as the disease very frequently arises from defective breast-milk. The bowels should be regulated, the kidneys stimulated by diuretics, and every possible effort made to enrich the blood, and improve the general health of the patient. Evacuating the fluid through the fontanelles, by means of the trocar, has been successfully resorted to in a few cases. Country air, salt water bathings, a rich, nutritious diet, and general tonics with iron, are also essential.

HYDROTHORAX.

Hydrothorax, or dropsy of the pleura, rarely occurs as an idiopathic affection, but is usually associated with a general dropsical condition of the system, especially œdema and anasarca. It may be of an active or passive form, arising from organic cardiac affections, congestion or inflammation of the pleura, organic or functional, hepatic or renal difficulties, dyspepsia, suppressed respiration, anæmia, etc. It is particularly liable to be connected with organic heart disease. The distinctive feature of hydrothorax is the existence of effused fluid in both cavities of the pleura. It is always double, excepting where adhesions are formed on one side, the result of a previous attack of pleuritis. The amount, however, is not always uniform in both sides.

Symptoms.—When the effusion into the pleura is slight, only a slight uneasiness is felt in the lower part of the chest; but as it continues, the patient suffers uneasiness in assuming the recumbent posture, a cough, and difficulty in breathing, being the result. As the accumulation increases, the dyspnœa becomes more severe, and quite distressing: the face is œdematous, the cheeks assume a purple, and the lips a livid hue; the skin is dry, urine scanty, bowels constipated, and there is thirst, and more or less mental excitement.

Physical signs.—The physical signs are, a dulness upon percussing the chest, absence of the respiratory murmur, tubular breathing, bronchophony, ægophony, fulness of the affected side, and a bulging at the intercostal spaces. For treatment, see hydropericardium.

HYDROPERICARDIUM.

Hydropericardium, or dropsy of the heart, is frequently associated with hydrothorax, in which case, its symptoms are somewhat complicated during the early stages; but as the accumulation increases, there is a feeling of uneasiness, or pressure in the cardiac region, a slight cough, difficult and irregular respiration, faintness, oppression in the præcordial region, excessive nervous irritability, disinclination to assume the recumbent posture, a small, irregular, and feeble pulse, a purplish or livid hue of the face and lips, capricious appetite, disturbed sleep, and delirium. When a case is about

to terminate fatally, there is stupor, irregular and feeble action of the heart, cold extremities, a clammy perspiration covers the surface of the body, and death closes the scene. The physical signs are, dulness over the affected part, a diminution or decrease in the sounds of the heart, a lessened impulse, and a disturbed rhythm. In relation to its causes, it is not necessary to add any thing to what has been already stated. In its serious forms, it is usually the result of disease of the heart, great blood-vessels, or lungs.

Diagnosis.—Very little difficulty attends the diagnosis of this disease, if careful attention be paid to all the symptoms developed.

Anatomical Characters.—The anatomical characters, presented upon dissection, are effusion of serum within the pericardium, and occasionally vascularity, and ulceration of its lining serous membranes.

The *prognosis* in this disease, is usually favorable.

Treatment.—In cases of hydrothorax and hydropericardium, the cardiac disease must receive especial attention. The fluid may be evacuated by means of small doses of elaterin, podophyllin, or jalapin, followed by a free use of a decoction of equal parts of chimaphila umbellata, galium aparine, and aralia hispida. When it cannot be removed by these means, the trocar should be resorted to, followed by an active tonic, and stimulating course of treatment. In cases of violent action of the heart, one to two grains of nitrate of potash, given in a strong tea of althæa officinalis, will usually relieve the symptoms. A gin tincture of the momordica elaterium, in dram doses, three or four times a day, is said to have cured several cases of hydrothorax. Other diuretics, referred to under the heads of dropsical diseases, may also be employed in these. Iodide of potassium, especially, has been very highly recommended.

PULMONARY ŒDEMA.

Pulmonary œdema, or dropsy of the lungs, is characterized by serous effusion into the parenchymatous tissue. When existing to any great extent, it occasions great dyspnœa, hurried respiration, cough, and copious expectoration of a thin, colorless, frothy mucus. Dulness upon percussion, a diminution in the respiratory murmur, and the sub-crepitant and mucus râles, are the physical phenomena characteristic of the disease. It is frequently associated with gen-

ral anasarca, or with pleuritic effusion. The causes of pulmonary œdema are the same as those of dropsy in general. The affection may run a rapid course, and terminate fatally in a few days; but usually, it assumes a chronic form. The effusion may take place either into the air-cells, or the extra-vesicular cellular tissue. The lungs do not collapse upon the opening of the thorax, have a yellowish color, pit on pressure, and are less crepitant, and heavier than in health. Upon being cut, serum may flow, or be pressed out like water from a sponge.

Treatment.—This can usually be relieved by a lobelia emetic, a thorough vapor bath, and the liberal use of diaphoretics and anodynes.

HYDROCELE, OR DROPSY OF THE SCROTUM.

Dropsy of the scrotum is a collection of water in the membrane which surrounds the testicles. There are a variety of causes, such as rheumatism, gout, scrofula, etc. In some cases, the water increases to such an extent, that the tumor becomes very large.

It can easily be distinguished from disease of the testicles, by discovering whether it is opaque or transparent. This may be done by holding a lighted lamp on the opposite side.

Treatment.—Give the patient a free purge of anti-bilious physic and cream of tartar, after which administer the following syrup:—Take queen of the meadow, one ounce; colt's foot, or asarum canadensis, one-fourth of a pound; yellow parilla, one-fourth of a pound. Make one quart of syrup, and add two drams of iodide of potassium. Let the patient take one table-spoonful three times a day. Pass a strong current of electricity through the tumor four or five times a day, also give a free purge of podophyllin and cream of tartar three or four times a week. If this should not succeed, a suspensory bandage may be worn; or the water may be drawn off by means of a trocar, and the scrotum injected with the wine tincture of hemlock bark, to prevent a return of the infusion. Also, give one or two grains of apocynin two or three times a day.

MORBID CONDITIONS OF THE BLOOD.

HYPERÆMIA, OR PLETHORA.

Hyperæmia, or plethora, implies an excess of blood in any organ or tissue of the body. It is usually, however, associated with changes in the elementary constituents of the blood. This is always the case when the hyperæmia is not a precursory symptom of inflammation, or dependent upon some idiopathic affection. When it merely exists in too great abundance in one or more organs or tissues, it is styled partial *plethora*, or a *local congestion* of the blood. This condition frequently occurs when there is a diminution in the quality or quantity, by disease. We have *active* congestion, when there is an increased flow of blood through the arteries to an organ; *mechanical*, when the return of blood to the heart, through the lungs, is retarded; and *passive*, when its circulation through the capillaries, of a part, is sluggish.

Causes.—The cause of plethora may be congenital. Excessive eating, especially of animal food, stimulating wines, condiments, diminished expenditure of blood in the various vital processes, incident to sedentary or indolent habits, are, singly or conjointly, the most efficient agents in the production of plethora. Any thing checking secretion may give rise to it; as cold, the arrest of periodical or habitual hemorrhages, the healing of old ulcers, and the drying up of long-continued issues. Continued moderate warmth, particularly following cold weather, sometimes favors this process of morbid sanguification. It may result from the loss of an important part of the body. Certain constitutional influences may produce it, as utero-gestation. Females are more subject to it than males, and adults rather than children.

Symptoms—Hyperæmia is plainly indicated by distention of the capillaries, as may be observed by the florid cheeks, the redness of the lips, tongue, conjunctiva, and mucous membranes generally; a full, strong, and somewhat accelerated pulse, and turgescence of the veins. It produces lassitude and indolence, mental and physical hebitude, a desire for sleeping, snoring, and dreaming, which increases in severe cases, and is attended with cerebral oppression, vertigo, cephalalgia, tinnitus aurium, difficult respiration, palpita-

tion of the heart, and hemorrhage from the nose or rectum. Obesity is sometimes an accompaniment, though this is not usually the case, as many fat persons suffer from a deficiency in the nutritive function, rather than an excess, and consequently this copious secretion of adipose matter has a tendency to keep down any plethoric accumulation to which the individual has been predisposed.

Diagnosis.—Plethora should not be confounded with other morbid conditions of the blood. Fulness of the vessels, owing to some retardation to the circulation, has frequently been considered as plethora. In this condition, however, there is a decrease, rather than an increase of the red globules of the blood, which is styled *pseudo-plethora*. In this state, there is usually an indication of deficient æration of the blood, accompanied with dulness and oppression, instead of heightened activity of the functions of the brain, and other organs. A microscopical examination of the blood may be sufficient to determine the existence of the disease, if the practitioner can discern whether the red globules, in several successive specimens, are in excess or not.

Treatment.—Formerly the almost universal practice for plethora, was venesection, and a thorough antiphlogistic treatment, such as mercurials, tartar emetic, etc. But recent observations have demonstrated the fact, that plethora can be as successfully treated by out-door exercise, a restricted diet of plain food, the absence of alcoholic drinks, and the frequent opening of the bowels, by saline purgatives, sulphate of soda, and sulphate of magnesia. Bromide of potassium, and acetate of potash, have been highly recommended. In some cases, such as hyperæmia of the brain, an active hydragogue cathartic may be required, suchas a full dose of podophyllin, and cream tartar. The above treatment will not only subserve all the purposes of the former heroic practice, but will preserve the integrity of the constitution.

ANÆMIA.

Anæmia, spanæmia, hydræmia, or oligæmia, is a condition of the blood, characterized by an excess of serum, and a deficiency of red blood corpuscles, and of the albuminoid constituents. If the blood be analyzed, it will be found that the red globules, instead of existing in the proportion of about 130 to 1,000 parts, as in a

healthy condition, they are reduced to 80 or 60, or even 30, in severe cases.

Anæmia is of frequent occurrence, and is incident to a variety of affections, giving rise to numerous phenomena. It occurs much more frequently than its opposite morbid condition—plethora. It may occur at any age in both males and females, but more frequently in the latter.

Causes.—The purest exemplification of anæmia, is that resulting from an actual loss of red globules, as in copious hemorrhages from wounds, flooding after labor, menorrhagia, or repeated blood-lettings. It may result from a diminution of the constituents of the liquor sanguinis, or blood-plasma, upon which the production of red corpuscles depends. Frequent causes of this class, are prolonged lactation, and a rapid succession of pregnancies. Still another class, is that proceeding from deficient alimentation.

Of the great number of affections with which it is associated either constantly or frequently, may be enumerated the following: —Tuberculosis, carcinoma, Bright's disease, albuminuria, chronic dysentery, diarrhœa, chronic pleurisy, leucorrhœa, scurvy, etc., embracing all diseases resulting from an unusual expenditure of blood; affections produced by imperfect assimilation, as indigestion, anorexia, vomiting, etc.; those which involve a loss of corpuscles, as hemorrhoids, hæmatemesis, menorrhagia, etc.; certain hepatic derangements, particularly cirrhosis; protracted periodical fevers, and certain mineral substances, as lead, mercury, etc., introduced into the system.

Symptoms.—The principal symptoms peculiar to anæmia are a pale, waxy, blanched appearance of the countenance, lips, tongue, and inside of the mouth, owing to a deficiency of the hæmatin, or coloring matter contained in the red globules, puffiness of the eyelids, the lower ones are apt to be encircled with a streak of a dark, leaden color, a feeble and rapid pulse, anorexia, indigestion, flatulency, irregular action of the bowels, general languor, debility, a free secretion of pale, limpid urine, depression of spirits, cephalalgia, vertigo, tinnitus aurium, drowsiness, restlessness, and peevishness. In some cases, there is an enlargement of the thyroid gland, and an unnatural prominence of the eye-balls, exopthalmos, proptosis oculi, giving them an enlarged, wild, and startling appearance, as

if the orbits were too small for their contents. There may be pain in the hypochondriac regions, associated with cough, dyspnœa, palpitation, syncope, etc. The bowels are torpid, with occasional attacks of diarrhœa, and there may be œdema of the ankles, with or without albuminuria. There is a morbid, nervous sensibility, and muscæ volitantes, with scintillations, are frequent complaints. The temperature of the surface and extremities is lessened. In females, the menses are either suppressed, or pale, watery, and scanty.

If the disease continue any great length of time, general atrophy sets in, associated with dropsical effusions, diarrhœa, great dyspnœa, profuse perspiration, and spasms, or convulsions. Owing to the low degree of vitality which exists in consequence of these symptoms, the system is unable to resist the influence of any *materies morbi* to which it may be exposed: hence, death may result suddenly from syncope, coma, or convulsions, or gradually from exhaustion.

Auscultation reveals a soft systolic bruit or bellows sound, over the origin of the aorta and pulmonary arteries. An intermittent murmur, synchronous with the beat of the pulse, is heard in some cases, through all the arteries. A continuous humming, cooing, or even whistling murmur, the *bruit de diable*, may be detected over the right jugular vein, which is owing to the descent of the attenuated blood through the great cervical veins, and its watery state, in consequence of which its particles move more easily over each other.

Anatomical Characters.—A post-mortem examination reveals a flabby and pallid condition of the tissues, a comparatively bloodless state of the heart and vessels, and sometimes an enlargement of the thyroid gland.

Chlorosis.—Chlorosis, or the chronic form of anæmia, frequently affects females about the age of puberty. According to some authorities, it is supposed to originate from a nervous affection, owing to a derangement of the digestive, circulatory and uterine functions. In many instances, it is intimately connected with disordered menstruation, and sexual causes. The red corpuscles are pale and small, and diminished in numbers. The countenance assumes a

wax-like hue, which is so remarkably characteristic, that the disease is popularly known as the *green sickness.*

Symptoms.—The appetite is irregular, with craving for particular kinds of food, the urine is thick and sedimentous, and there may be vertigo, headache, palpitation, backache, hysterical affections, dysmenorrhœa, and leucorrhœa. The tongue is flaccid, and indented at the edges, the pulse is weak and quick, and there is a feeling of general languor, with great indisposition to bodily or mental exertion. Auscultatory signs are peculiar to those occurring in anæmia.

Treatment.—The treatment of chlorosis and anæmia depends upon the cause producing them. When arising from feeble and imperfect digestion, the powers of the stomach may be increased by the use of xanthoxylin, alnuin, strychnin, and hydrastin. One of the most valuable compounds for the purpose of imparting tone and vigor to the digestive organs, is that of the anti-dyspeptic mixture, of which a dram should be taken three or four times a day. When the stomach will tolerate it, one dram of neat's foot, or cocoa oil, should be taken three or four times a day; or the following compound given:—Take oleum morrhuæ, two ounces; tincture of capsicum, one dram; sodæ chloridi, two drams; ferri carbonas, one dram; syrupus simplex, four ounces; fluid extract of nux vomica, one dram; dose, one teaspoonful four times a day, immediately after eating, and upon retiring. In case of chlorosis, two ounces of the tonic tea and one dram of ferri subcarbonate may be added to a quart of port wine, and a wineglassful administered three or four times a day. Baths, friction, out-door exercise, and a nutritious diet, will aid much in the treatment. When cod liver or other oils cannot be taken, cream may be substituted. Sea bathing, and gentle horse-back riding, are also beneficial.

LEUCOCYTHEMIA.

When the human blood is examined under the microscope of two hundred and fifty diameters, it will be observed to be composed of two sets of small, round bodies, of different colors. These are the white and red corpuscles. (See fig. 29.) The small, round bodies, which are aggregated together, and arranged in rows, are the red corpuscles; and the small bodies which are separate, and appear to

be filled with granular matter, are the white ones. Fig. 30 is the same after the addition of acetic acid. In the normal state the number of red corpuscles is very large, in comparison to those of the white, about the proportion as represented in fig. 29. In leucocythemia, the white blood-corpuscles become abundant, while the

Fig. 29. Fig. 30.

red blood corpuscles either remain stationary, or are diminished in number. It is now generally considered by physiologists that the colored corpuscles are formed from the colorless ones; but Mr. Bennett, in connection with some others, is of the opinion that the colored blood disc is merely the liberated nucleus of the colorless cells. Of the mode of transformation he remarks, that the colorless cells may frequently be seen, on the addition of acetic acid, to

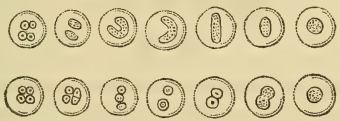


Fig. 31.

have a single round nucleus; but more commonly the nucleus is divided into two, each half having a distinct depression, presenting a shadowed spot in the centre. Occasionally, before the division takes place, the nucleus becomes oval, and sometimes bent, and even of a horse-shoe form. (See fig. 31.) Fig. 31 shows the colorless

a *b*

Fig. 32.

blood-cells, as observed in leucocythemia, arranged in the order of the development of the nuclei. (See fig. 32.) Fig. 32 shows the

development of the nuclei in colorless blood-cells; *a*, as found in the lymphatic vessels; *b*, increased development. Mr. Bennett regards the formation of white blood nuclei as dependent upon the aggregation of granules in the chyle; and that in the lymphatics, or blood-glands, which consist of the spleen, thymus, lymphatics, thyroid, and supra-renal capsules, they undergo still farther development. (See fig. 33.) Fig. 33 shows the order of the development. He also claims that the liberation of the nucleus, and its transformation in the lungs, constitutes the red corpuscles. Fig. 34 shows the nuclei of the blood cells after the addition of acetic acid. (See fig. 34.) From this hypothesis, or theory of the development of the formation of blood, Mr. Bennett infers that

Fig. 33.

Fig. 34.

many of the most important pathological changes of that fluid depend upon a disordered condition of the blood-glands; and in leucocythemia, his observations appear to be confirmed, as it has been shown in this disease that the blood-glands are the primary seat of the difficulty. He explains the disease by showing that when these organs are diseased, the cell elements of the white blood-corpuscles circulate in the blood without undergoing transformation into red blood-corpuscles, thus producing a superabundance of white blood-cells, and a corresponding diminution of the red blood-corpuscles.

Symptoms.—This disease usually commences very slowly, frequently continuing for years' previously to manifesting its fatal symptoms. The first indications of its approach are slight dyspeptic symptoms, connected with disordered respiration, which frequently amounts to more or less dyspnœa. In connection with these symptoms, there is a peculiar, light-sallow complexion. As

the disease advances, the spleen, liver, kidneys, and lymphatics will be found enlarged, and otherwise disordered. There is great emaciation, and more or less swelling of the abdomen. In some instances, diarrhœa is an attendant, and there may be hemorrhages in some form, but particularly epistasis, urine loaded with uric acid, nausea, jaundice, fever, anorexia, together with œdema of the legs, anasarca, or ascites, dependent on the abdominal enlargement.

Treatment.—The treatment consists in restoring the powers of the stomach, which are always impaired in this difficulty, the use of nutritious and stimulating food, and the introduction of such remedies as will stimulate the blood-manufacturing apparatus generally. The remedies that act most specifically as tonics upon the blood-glands, are alnuin, helonin, chimaphilin, ceanothin, and iron. We have found most decided benefit to follow the use of the following compound:—Take alnuin and helonin, of each one dram; hypophosphite of iron, one-half dram; carbonate of iron, one dram; Mecca oil, one ounce; simple syrup, five ounces. Mix, and let the patient take a teaspoonful four or five times a day. Benefit will also be derived from a lobelia emetic once a week, followed by a thorough spirit sweat. Instead of the Mecca oil, I have used the neat's foot, cocoa, and cod liver oils. Another compound, which I have found very beneficial in this disease is the following:—Take fluid extract of xanthoxylin, one dram; fluid extract of chimaphila umbellata, two ounces; cod liver oil, two ounces; iron per hydrogen, one dram. Mix, and let the patient take a wine-glassful in a tablespoonful of the best gin. Ammonia, in the form of carbonate, is also a remedy that may be beneficially used. Much good will also be derived by the use of light wines, and occasionally brandy. The diet should be nutritious, and consist of rare-cooked eggs, roast beef, etc.

COAGULATION OF BLOOD.

When healthy blood is drawn from the body, it forms, in about ten minutes, a gelatinous mass, owing to the tendency of the particles of fibrin dissolved in the plasma to agglutinate together. In the process of coagulation, the organized elements become entangled in the meshes of the fibrin; and when the process of solidification is completed, which occurs in the course of fifteen minutes, the glu-

tinous mass will be observed shrinking and resolving itself into two distinct portions, the coagulum, crassamentum or clot, consisting of the fibrin, and containing the red and white globules; and the serum, which holds in solution albumen, together with other organic and certain saline ingredients. This shrinking is due to the farther coagulation or contraction of the fibrin, and it continues for some thirty or forty hours, after which no more serum is expressed. The corpuscles may either be diffused equally through the clot, giving it a reddened appearance, or they may, by sinking from its surface, leave the upper part colorless. When this occurs, the colorless layer of fibrin, not being encumbered with corpuscles, contracts more than the lower part, and under these conditions, the clot is said to be "buffed" and "cupped." The serum is the liquor sanguinis, minus the fibrin. It is a pale-colored, watery solution of albumen, of a specific gravity of 1,029, being of alkaline reaction, and holding many important substances in solution. The albumen is probably combined with soda, and it is the plastic material from which the soft tissues are nourished, and by which the cells themselves grow. The fibrin probably arises from it, to be used up for the renovation and repair of the muscular tissues. Slow coagulation of the blood, and an excess of fibrin, characterize acute inflammation; hence, the buffy coat occurs when this condition exists, and blood presenting it, is styled *inflammatory blood.*

Besides the two conditions named, slowness of coagulation and excess of fibrin, necessary to the production of the buffy coat, others may give rise to it. If the serum be thin and watery, the specific gravity of the red globules becomes relatively greater, and they sink more rapidly; and if the red globules be much reduced in number, the upper portion of the clot is devoid of them, the proportion of fibrin to the globules is proportionately increased; although the former is not actually more abundant than in health, the buffy coat may be formed.

The buffed and cupped appearance of the blood is not peculiar to inflammatory blood, as was formerly supposed, as it occurs in chlorosis, and other non-inflammatory affections, and is not, therefore, a criterion of inflammation. The size and consistence of the clot are highly important. A large, firm one, which is buffed and cupped, is highly characteristic of inflammation; while, on the other hand,

that incident to an impoverished state of the blood, is small in size, and probably less firm.

An abnormal, aqueous state of the blood, an undue quantity of carbonic acid, introduction of alkalies, sugar, casein, and albumen, into the blood, etc., retards the progress of coagulation. It takes place more rapidly if the blood trickles slowly from a vein, than when it flows freely in a stream. Violent agitation of the blood, produced by shaking or stirring, hastens the separation of the fibrin. The blood which flows last, coagulates more rapidly than that received first from the venesection, and the process is quicker when the blood is received into a warm, wide and shallow basin, than a cold deep narrow one. The more rapid the coagulation, the larger, softer, and looser the clot, and conversely, the slower the process, the smaller and firmer the clot.

The discovery of the essential nature of the coagulating process of the blood has long attracted the attention of physiologists. To every theory that has been advanced by Hunter, Draper, Hewson, Richardson, and others, objections have been offered. We only know for certain, that this process is favored by rest, warmth, free access of air, the multiplication of points in contact, and the withdrawal of the influence of living vessels. The blood receives matter from the atmospheric air, through the lungs, and from primary and secondary digestion, and in return it affords material for the structure of the tissues, the formation of the secretions, and the production of the excretions. Hence, whatever interferes with the process of chylification, with respiration, and with the excretory organs, will affect the composition of the blood. Paget states that "each single part of the body, in respect to its nutrition, stands to the whole body, in the relation of an excreted substance;" and this certainly is true. The changes which occur in the blood under different circumstances, will be noticed in treating of the various diseases of the human system. We might, however, premise, that as disease and death may occur from the retention or introduction of injurious matters into the system, so may they also arise from a deficiency or absence of nutritive elements.

It is exceedingly difficult to ascertain the exact chemical composition of healthy blood, but from the analyses which have been made, we may, for practical purposes, regard the following table as indicating its constituents:

Water, - - - - - - -	760 to 800
Oxygen, Carbonic acid, Nitrogen, } dissolved in the fluid.	
Red Corpuscles:	
Cell membrane, Hæmatin, } - - -	130 to 150
Fibrin, - - - - - - -	1 to 3
Albumen, - - - - - - -	60 to 70
Salts:	
Phosphate of soda, lime, magnesia, and iron, Sulphate of soda, Chlorides of sodium, potassium, silica, etc., }	5 to 10
Fats:	
Margarine, Oleine, Seroline, Cholesterine, Phosphuretted fats, etc., } - -	1 to 3
Extractive matters, with traces of urea, uric acid, etc., - - . - - - -	1 to 4

THROMBOSIS AND EMBOLISM.

By thrombosis is generally understood the partial or complete closure of a vessel, by a morbid product developed at the site of the obstruction. The coagulum, which is usually fibrinous, is known as autochthonous clot, or thrombus. The term embolism designates an obstruction caused by any body detached and transported from the interior of the heart, or of some vessel. Thrombi, or emboli, vary in size, from masses as large as a pea, bean, or even a filbert, to a particle which will enter a capillary vessel. They may consist not only of fibrin, but of a fragment of gangrenous tissue, or of the constituents of tubercle, or, cancer which may have entered the vessel. When any obstacle to the normal circulation exists, fibrinous formations may occur during life in the heart, arteries, veins, cerebral sinuses, or in the portal system. When a portion of fibrin coagulates in one of the arteries, and is carried along by the circulation, it will be arrested, of course, in the capillaries, if not before; when in the veins, it may not be stopped until it reaches the lungs; and when in the portal system,

the capillaries of the liver will prevent its further progress. Even if emboli should form in the lymphatics, yet the passage of these vessels through glands must prevent their transit for any great distance along them. The formation of thrombi may act primarily, by causing partial or complete obstruction; and secondarily, either by larger or smaller fragments becoming detached from their end, and being carried along by the circulation of the blood to remote vessels, *embolism;* or by the coagulum becoming softened and converted into a purulent matter, constituting suppurative phlebitis. These substances occur most frequently in those affections characized by great exhaustion or debility, as diphtheritis, croup, scarlatina, typhus fever, bronchitis, pneumonitis, phthisis, endocarditis, purpura, erysipelas, hemorrhage, phlebitis, gangrena senilis, etc. Fatal cases of croup are more frequently attributable to them than to simple asphyxia. The condition of the blood during pregnancy, and puerperal fever, favors their formation. These concretions may form suddenly, and produce instantaneous death, by retarding the current of the blood; or they may arise gradually, in which case the thrombi may be organized and attached to the walls of the heart, or they may soften, and fragments of them, emboli, may be carried away by the blood, and obstruct the circulation at some extreme point. The small, bead-like, and warty exudations occurring sometimes in endocarditis, may occasionally form a foundation on which a concretion may become deposited.

Symptoms.—The symptoms of heart clots are always characteristic, and are of the same general character in all cases. Their nature varies according to the situation of the concretion on the right or left side. When on the right, the return of blood from the systemic system and the aeration in the lungs are impeded, and consequently the brain and other organs are unduly supplied with arterial blood. Hence, if death occur, it is owing to syncope, rather than asphyxia. The symptoms experienced are hurried and gasping breathing, paleness and coldness of the surface, a feeble and intermittent pulse, faintness, and nervousness.

The effects which have been found to ensue from a fibrinous deposit, being carried from the right side of the heart, are coagula in the pulmonary arteries, and different kinds of deposit in the parenchyma of the lungs. This condition is indicated by œdema or in-

filtration of the lung tissue, and by pulmonary apoplexy. In the same way cancerous fragments may be brought to the right side of the heart, and thence transmitted to the lungs, where they become arrested in the capillaries, inducing stagnation, and subsequent changes in the blood.

When the clot is situated in the left cavities of the heart, or in the aorta, death, if it occurs, takes place either suddenly or at the end of a few hours, from coma. The symptoms, then, are violent adynamic palpitation, suffocative dyspnœa, violent congestion of the lungs, a bloody and frothy mucous expectoration, a leaden view of the surface, with coldness of the extremities. If the patient recovers from the first urgent stage, the symptoms will merge into those of valvular obstruction. The consequences which may follow from the propulsion of the fibrinous deposits from the *left* side of the heart, are ramollissement cerebelli, terminating in hemiplegia, paralysis and loss of sensation in the arm, temporary paralysis of one of the lower extremities, and diseases of the kidneys and spleen.

Anatomical Characters.—When coagula are observed in the heart, it may become a question whether it was formed during life or after death. The loose, dark coagula, so often found after death, are polypi. In these cases there is stagnation of blood, owing to which the fibrin forms only a light-colored layer on the upper part of the dark coagulum. If the deposition has taken place during the last moments of life, the fibrin will be isolated and soft, but not adherent to the walls; but if it be isolated, dense and adherent, or closely intertwined with the muscles of the papillæ, and tendinous cords, the deposition has occurred at a period more or less remote from the act of dying. Occasionally, the fibrin has been seen lining one of the cavities of the heart, like a false endocardium; or else forming an additional coat to the aorta or other large vessels, without producing any obstruction. The thrombi, in some instances, soften in their centres, and are then observed to contain a puriform substance. If the process of softening be extended considerably, an outer shell or cyst, only, may remain. Occasionally the latter may become ruptured, and the contents mingle with the blood, producing typhoid symptoms.

Prognosis.—The prognosis must always be guarded. The sources of danger exist not only in the interruption of the circulation of the blood, but also in a morbid state of the system, produced by the dis-

turbed nutrition of a limb or organ, as well as in the mingling of purulent and gangrenous elements with the blood.

Treatment.—The treatment for thombus consists in relieving the urgent symptoms by rest, stimulants, and the use of such agents as will act as solvents to the fibrinous clots. The alkalics are known to possess this property in a remarkable degree. This is especially the case with carbonate of ammonia; hence, it may be administered in all cases of thrombus with much advantage. Dr. Tanner gives the following recipe, to be used in these cases: Take olei cocæ nucis, two fluid drams; spiritus ammoniæ aromaticæ, twenty drops; ferri et ammoniæ citratis, five grains; aqua mentha piperitæ, one fluid ounce. Mix, and make a draught, to be taken two or three times a day. Iodide of ammonia, and the compound syrup of stillingia, also form a valuable remedy in these cases, in the proportion of one ounce of the former to four of the latter, taken three or four times a day. In cases where there is ichorous or purulent matter circulating in the blood and lymphatics, antiseptics, diuretics, and stimulants are required. It is in these cases that whisky and brandy, in connection with baptisin, creasote, and nitro-muriatic acid, are found so beneficial. In case of great debility, capsicum and xanthoxylin should be liberally administered. Hot vapor baths, and friction, will also aid much in the treatment.

PYÆMIA.

Pyæmia pyohæmia, purulent infection or pyogenic fever, is a morbid condition of the blood, resulting from the introduction of ichorous or putrid matters into the system, characterized by severe constitutional symptoms, and suppuration of some important organs. It never exists as a primary affection, but occurs as a sequela of wounds, injuries, boils, abscesses, and erysipelatous or suppurative inflammations.

Its presence in the blood induces a toxæmic condition, characterized by a diminution of fibrin and of red corpuscles, and a proportionate increase of the colorless cells. When only a small quantity enters the circulation, it may be eliminated or destroyed without affecting any material change in the system, but when it exceeds a certain amount, it may produce coagulation, and the formation of clots within the vessels and the cavities of the heart.

Pathology.—It was formerly supposed, that the pus was absorbed and conveyed to the blood, and redeposited by the blood in other organs and tissues of the body. This theory, however, is incorrect, as the size of the pus-corpuscle is such as to prevent its passage through the coats of the vessels. It can only enter the vessels from without, as pus through an opening into the vein, and when contained within them, it cannot transude through their unbroken parietes; consequently, the purulent collections are not, strictly speaking, deposits or metastatic, but involve the production of pus in the different situations in which it is found.

Another hypothesis entertained, was that, owing to their size, pus-corpuscles are arrested in the capillary vessels, produce mechanical obstruction, and serve as nuclei for fresh purulent formations; but as the presence of pus serum is insufficient to cause purulent infection, this idea is purely erroneous. However produced, the appearance of purulent collections in different organs or tissues, is characteristic of pyæmia, but the proof that this disease is owing to the presence of pus in the blood, is not as complete as could be desired. Formerly, the microscope was exclusively depended upon for the detection of pus in the blood, but since the publication of Dr. Hughes Bennett's Researches on Leucocythemia, in 1852, it has generally been allowed by the best microscopists, that the so-called pus-corpuscles observed in the blood are identical with the white globules of that fluid, or, in other words, it is impossible, by means of the microscope, to discriminate between leucocythemia and pyæmia. Virchow maintains, that, in many instances, coagula are formed without inflammation, in which phlebitis was supposed to exist, and that, under such circumstances, dissolved fibrin, forming a puriform liquid, is carried into the circulation not genuine pus. That a morbid condition of the blood exists, giving rise to the phenomena characteristic of pyæmia, is not to be doubted, but whether the presence of pus corpuscles has any thing to do with it must be considered doubtful, as experiments on inferior animals have proved, that the phenomena of purulent infection of the blood may be produced by injecting pus serum without the corpuscles.

Varieties.—Pyæmia is not unfrequently the cause of very dangerous symptoms after parturition and surgical operations. In

other cases, the patient is so deeply affected from the very commencement, by the morbid matter, that a fatal termination occurs before any local phenomena can be developed. In some instances, the severity of the poison appears to be exerted upon the liver, or the mucous membrane of the intestinal canal, which nature seems to eliminate by the discharge of a large quantity of dark bile, on the one hand, and by a severe attack of diarrhœa, or dysentery, on the other. In another class, the serous membranes bear the brunt of the poison, in which case, pleurisy, pericarditis, or peritonitis, may supervene; or the cutaneous surface may be affected, producing erysipelas, or a more or less copious eruption of boils. There is still another class, in which profuse suppuration ensues, giving rise to secondary, or metastatic abscesses in different organs. They are most apt to occur in the parenchyma of the lungs and liver, where they vary in size, from that of a pin's head to a walnut, but they also form in the kidneys, joints, muscles, eyes, beneath the cutaneous integument, and in other situations. Other effects manifested in the solid parts are congestion of the lungs, hemorrhages, and softening of the muscular structure of the heart.

Among the different forms of suppuration, is that of *cellulitis venenata*, a diffused inflammation of the areolar tissue, arising from punctures received in dissecting. Some animal fluids are more dangerous than others, as the serum found in the abdomen after peritonitis, and that left after gangrenous inflammation. The bites of certain venomous reptiles, or even the sting of a bee, may produce the same effects. No matter what the nature of the poison, it, when absorbed, produces inflammation of the areolar tissue, and absorbents, generally of the wounded limb, but sometimes of remote parts. Quite often the lymphatic glands are affected. The swelling communicates a peculiar boggy feeling to the touch, and the skin over the affected portion is pale, tense, and shining. The symptoms attendant upon these inflammations are rigors, restlessness, severe pain, and great depression. They may terminate in death in a few days, or even hours, or end in suppuration or gangrene. In fatal cases, the final issue is preceded by dyspnœa, delirium, offensive perspiration, jaundice, drowsiness, and deep stupor. If recovery take place, the constitution usually remains permanently injured.

The effluvia from the dead body, may, without injuring the person exposed to it, be carried by him to a third person, and be the cause of extensive toxæmia, or blood-poisoning, giving rise to the most distressing results. In the Lying-In-Hospital of Vienna and Prague, a large mortality was distinctly traced to a want of caution in admitting students from the dissecting rooms to the wards. The danger which arises from handling unhealthy purulent secretions, morbid preparations, etc., is equally great, and too much caution cannot be exercised.

Symptoms.—The symptoms of pyæmia or ichorhæmia resemble closely those of erysipelas. It generally is ushered in with a severe rigor, followed by intense heat, perspiration, a frequent pulse, and occasional unnatural discharges from the bowels. There is often a repetition of these rigors, sometimes occurring periodically, or in their substitution, there may be various convulsive affections. Then, if there is an open wound, it sloughs, or becomes indolent, and discharge ceases. In most cases, there is a series of symptoms resembling those of typhus fever, great prostration, extreme restlessness, anxiety, a peculiar sweetish, or fermentative odor of the breath, and of the body generally, diarrhœa, dyspnœa, cough, hurried respiration, cardiac pains, low, muttering delirium, and subsultus tendinum and diarrhœa. The body wastes, the feebleness becomes extreme, the lips and tongue are brown, and covered with sordes, there is jaundice, profuse perspiration, with perhaps effusion into the pleura or pericardium, or a low form of pneumonia increases the exhaustion, and the patient dies. The suffering from diffuse suppuration in the tissues or joints, may be most severe.

Dr. Jenner, of London, has ascribed the name of *pyogenic fever* to the symptoms above enumerated.

Prognosis.—The prognosis in all forms of pyæmia is unfavorable, particularly if the strength of the patient has been previously lowered by exposure, fatigue, exhausting disease, hemorrhage, confinement, severe operations, insufficient food, or unhealthy locations.

Treatment.—As this disease mostly prevails in hot and damp seasons, crowded and ill-ventilated hospitals, or in crowded cities, where there is imperfect ventilation, with a putrid or contaminated atmosphere, the first attention should be paid to removing the patient to a well-ventilated apartment, and exposing him to the great-

est amount of air possible. The next attention should be directed to the stomach, bowels, and skin, which should be thoroughly cleansed; the stomach by a gentle emetic of lobelia, well stimulated by capsicum and ginger tea, and the bowels opened with small doses of rhei et potassa, or what I have found still more valuable, a half dram of the anti-bilious physic, mixed with five or ten grains of the sulphate of quinia. It may be given at a dose, and if not sufficiently active, castor oil, or neutralizing mixture, may be administered until the bowels are freely purged. This should be followed by a thorough alcoholic spirit sweat. As soon as this has been done, the patient may be placed upon antiseptics. Usually, sulphate of quinine, and muriate tincture of iron, are the remedies. A good formula is the following:—Take tinctura ferri chloridi, one fluid dram; aqua pura, four fluid ounces; quiniæ sulphas, twenty grains; mix, and let a teaspoonful be taken every hour or two. This may be followed by sulphite of soda. One ounce of the soda may be added to six ounces of water, and one teaspoonful given every two or three hours. The bowels should be kept open either by small doses of the sulphates of soda or of magnesia. One or two drops of creasote, added to each dose of the solution of sulphite of soda, adds materially to its antiseptic properties, and should be used in all cases when there is typhomania, nausea, vomiting, or purging. In cases of introduction of poisons by wounds, bites of reptiles, stings of insects, etc., the wound should be cupped or sucked, as soon as possible, so as to extract the poison; and if on the limb, it may be ligated, while this process is going on. The wound may also be cauterized with caustic of potash, and a free discharge maintained by hot flaxseed poultices. The application of sulphurous acid to the wound, will also destroy the virus in most cases, especially in dissecting wounds. The plantago cordata exerts a most powerful antiseptic influence over the various morbid elements that give rise to pyæmial diseases. Hence, it may be successfully used in cholera, malignant dysentery, typhus fever, and all other forms of this disease. A wineglassful of the strong decoction should be drunk freely, every two or three hours. In poisonous wounds, the herb has been boiled in milk, and applied as a poultice, with great success. Comptonia asplenifolia is another article that has been successfully used in this disease. Its use is

similar to the plantago. Alcohol has also been most extensively employed, and in case of the bite of poisonous reptiles, it is regarded as nearly a specific. Many cases are on record, where persons, after being bitten, have drunk from a pint to a quart of whisky in the course of an hour, with the effect of entirely neutralizing the virus. Cream, mixed with a small proportion of brandy, may be liberally administered as a nutriment and stimulant.

PYOHÆMIA.

Pyohæmia is a morbid condition of the blood, characterized by an increase of fat. The average amount of fat which enters into the composition of the corpuscular constituents, and liquor sanguinis, is estimated to be about two in one thousand parts, consisting of margarin, olein margarate, and oleate of potassa, cholesterin, and glyceri-phosphate of potassa. According to some determinations, it is more abundant in venous blood. The greater part of it exists in a state of saponification, with the exception of cholesterin, and serolin, which do not saponify with potash. During the process of metamorphosis of the blood, the greater part of the chyle is converted into fatty acids, owing to the accumulation of free fat, or oil globules, soon after the act of digestion. In health, the blood serum is turbid or milky for several hours after a meal. In certain pathological conditions of the liver and kidneys, and during inflammatory affections of the peritonæum, and of the lungs, so large a quantity of free and combined fat is sometimes observed in the blood, that the serum appears turbid, opaque, and even milky. In such instances, it is scarcely necessary to state that fat globules will be perceptible under the microscope. It is more or less abundant in acute affections, being chiefly derived from the adipose tissue within the body; hence the emaciation which accompanies them. It accumulates in the blood of drunkards, constituting obesity, which, Lehmann states, is not directly due to the alcohol, but that it occurs only when the liver becomes affected.

The physical *causes* of pyohæmia, are free fat and molecular albumen. In the first place, this morbid condition is the physiological result of digestion, pregnancy, lactation, and hibernation. According to Rodier and Becquerel, the lactescence of the serum

commences about two hours after the ingestion of aliment, and continues about two or three hours. The turbid, opalescent and semi-opaque appearance of the serum, which condition is only transitory, is due to the products of lacteal absorption, which is formed into an emulsion by the pancreatic juice, and absorbed as such in the duodenum. By microscopical examination, this condition is found to be due to to an accumulation of fat globules, and of molecular granules of albumen.

Christison and Lecanu have found that the passage of the chyle into the blood, renders the serum turbid, this condition continuing until the insoluble fatty matters are combined with the free soda of the blood, and converted into the oleic, stearic, and margaric acids. Lassaigne detected a fat of this nature in the blood, similar to the adipose matter of the brain. The lactescence of the serum is also the pathological result of disease. Marcet found the serum milky in diabetes, Christison in dropsy, icterus, and nephrites. Trail in hepatitis; and its occurrence has also been noted in chronic alcoholism, cholera, and Bright's disease, particularly the latter. Zanarelli observed this condition in pneumonia, and states that this milky blood is chyle which has not been converted into proper blood, owing to the affection of the lungs. An instance of milky blood was noticed in a case of mammary abscess, by Dr. Simon. It contained no fibrin, and upon standing a short time, a small quantity of coloring matter was deposited, which fluid was analyzed by Lecanu, and found to consist of the following: Water, 794, solid constituents, 206, albumen, 64, fat, 117, salts, and extractive matters, 25, and hæmato-globulin, a trace.

An interesting case of pyohæmia, associated with acute diabetes, is recorded by Dr. Coote, which ran a rapid course, and was attended with great prostration. The blood was found, after death, fluid, homogeneous, and of a dull red color, similar to that of raspberry cream, while, in a few seconds, it separated into two distinct portions, one layer being of the color and appearance of thick cream, and the other, that of fluid venous blood.

The presence of fatty blood in disease, was formerly supposed to be due to the passage of unaltered chyle into the circulation. This opinion was contradicted, however, by Hewson, who observed it in a number of instances, in which the patients had taken little

or no food for many days. Raspail maintained, that it was set free in the blood for want of a free alkali to hold it in the form of soap. Dr. Babington regards it as a fatty degeneration of the albumen of the blood. Virchow attributes it to the non-combustion of fat, and its accumulation in the blood, while he regards the molecular granules of albumen to be only a secondary feature. Rokitansky regards it as due to fatty degeneration of the colorless corpuscles, and as a modification of leucocythemia. Finally, Dr. Charles Coote, from a comparison of all the facts and theories upon this subject, concludes, that pyohæmia consists in an increase of saponifiable fat in the blood, and not in the mere liberation of fat from its combinations; that this condition may result from a diminution in the elimination of the fat, as in hibernation, and pulmonary diseases; or from an excessive ingestion of fat, as in pyohæmia during digestion; that fat, if directly ingested, may enter the chyle through the thoracic duct, and that it is not a result of diabetes mellitus, as one may exist independently of the other. This condition of the blood, being associated with specific diseases, is duly considered under their respective heads.

GLUCOHÆMIA, OR DIABETES MELLITUS.

Glucohæmia is a morbid condition of the blood, characterized by an abnormal increase of sugar. In healthy blood, it exists in an extremely minute quantity, and is most abundant a short time after meals. When a symptom of disease, it may exist in great abundance in the urine, in other secretions, and in exhalations, in which case the blood every where throughout the body contains it, constituting the affection commonly known as diabetes mellitus. The secretion of sugar in large quantities by the kidneys, has excited the attention of pathologists since the year 1660, when Thomas Willis first observed the saccharine condition of the urine in this affection. In 1778, Cowley succeeded in isolating the saccharine principle. Without, however, tracing the history of diabetes, it may at once be mentioned, that the first hypothesis of any importance was promulgated by Rollo, who stated, that the sugar formed in the stomach and alimentary canal, from the starchy and saccharine principles of the food, instead of being rapidly converted

into other compounds, as was supposed by Prout, was absorbed into the blood, and excreted by the kidneys. From experiments, made by Dr. McGregor, of Glasgow, he infers, that the sugar is formed in the stomach alone, from the digestion of food. After having convinced himself of its existence in diabetic blood, he sought for and found it in the matters vomited, both by a healthy man and a diabetic patient, three hours after eating. He also observed it in the fæces of diabetic patients, but none was found in the perspiration. It is well known, that in diabetes there is little tendency to perspiration; but, on the contrary, the skin becomes dry, rough, and peels off. In a case that fell under Willis' observation, the furfuraceous exfoliation of the cuticle had a decidedly sweet taste.

It necessarily followed from this theory, that the treatment of diabetes consisted in allowing such nutriment as was thought incapable of being converted into saccharine matter, and it is certain, that thus the general symptoms were frequently alleviated, and the excretion of the sugar greatly diminished.

The elaborate researches of M. Claude Bernard, in 1848, gave rise to other views as to the origin of diabetes. This eminent physiologist, while admitting that sugar may be formed in the process of digestion, and that a certain proportion of it may find its way to the blood, as a result of absorption from the alimentary canal, has yet farther taught that this substance is a normal secretion of the liver. Thus, if dogs were entirely fed on animal food, sugar may be found in the liver, and in the hepatic veins, while the portal vein is entirely free from it. He has also proved, experimentally, that glucohæmia may be formed by irritating the eighth pair of nerves at their origin in the fourth ventricle; while, on the other hand, section of these nerves destroys its formation. That sugar does not exist in a normal condition in urine, and in blood drawn from the arm, is explained by its rapid decomposition in a state of health, and its excretion by the lungs. In health, the sugar formed by the liver, passes into the hepatic veins, the inferior vena cava, the right cavities of the heart, and thence by the pulmonary artery to the lungs, where it is consumed. But when abnormally increased, the lungs cannot excrete the whole of it, and hence the remainder passes off by the kidneys, producing diabetes. Although the division of the pneumogastric nerves destroys the formation of sugar in the

liver, yet it is restored by irritating their upper cut ends, and diabetes may be produced precisely in the same manner as if the origins of these nerves were excited. Bernard therefore concludes, that the nervous power necessary for the secretion of the sugar does not originate in the brain, to be directly carried to the hepatic organ by the pneumogastrics, but rather that the stimulus proceeds indirectly along these nerves to the brain, and thence by reflex action is transmitted to the liver. Following out this theory, he found that whenever the respiratory function is violently stimulated, sugar appears in the urine; and that whenever chloroform or ether is administered, a temporary diabetes is occasioned.

Again, it is supposed that just as the lungs act on the liver by reflex action, so increased action of the liver acts upon the kidneys; and hence the sugar produced in excess by one organ, is excreted by the other. Continuing his researches, Bernard concluded that the liver does not secrete sugar directly, but rather a substance which presents all the physical and chemical properties of hydrated starch, which is changed into sugar by the aid of a ferment. This substance exists in the blood; and when it comes in contact with the lungs, it is decomposed by the oxygen of the air, and disappears. Hence, the liver and lungs are so far opposed to each other in function, that while the former produces the glycogen which forms the sugar, the latter decompose it; hence it follows that the occurrence of sugar in the system generally, and its presence in the urine is dependent upon an excess of hepatic, and a diminution of pulmonary action. Drs. Paley and G. Owen Rees have demonstrated that the sugar formed in the liver, and thrown out by the kidneys in diabetes artificially induced, is different from the proper diabetic sugar or glucose, as it undergoes decomposition by contact with animal tissue much more readily than the latter variety. Hence, the rapidity with which it is decomposed in health, in the course of the circulation. From these facts, Dr. Paley has inferred that the morbid condition in diabetes, is the production of the diabetic or grape sugar, or glucose in the liver, instead of the proper hepatic sugar. The former, entering the circulation, and not undergoing destruction as the latter does, is carried off by the kidneys, and produces the saccharine urine characteristic of true diabetes. Hence, the view of diabetes, according to this ingenious theory, is that the

liver has lost the power of generating genuine hepatic sugar, which is decomposed in the capillaries, but in its stead produces the grape sugar, or vegetable glucose, which is incapable of fulfilling the office of the hepatic sugar, because not decomposable by contact with the animal tissues, and is therefore thrown off by the kidneys. The proper hepatic sugar is termed amyloid substance by Dr. Paley, as in its chemical properties it closely resembles those of starch. It is chiefly derived from saccharine matter consumed as food, and from the metamorphosis of starch into sugar in the alimentary canal. It is carried by the portal system to the liver, and there converted into amyloid substance. , Dr. Paley believes that it is destined to enter the intestinal canal through the biliary ducts, and that it will be found entering both into the formation of bile and the production of fat. The important point to remember is, that although under natural circumstances during life the amyloid substance resists transformation until death, yet after death such a change is rapidly effected. An infinitesmal portion of sugar is normally present in the blood during life, as well as in the urine, so that diabetes is, in fact, simply an exaggeration of the scanty glycogenesis of health, the sugar from the alimentary canal, instead of being transformed into amyloid substance in the liver, passing through this gland into the general circulation, whence it is sure to appear in the urine. Admitting this fact, we can readily understand that this disease may only be temporary, and that it may be produced by certain articles of saccharine or starchy food, when taken in great excess. Abnormal states of the circulation, the inhalation of chloroform or ether may produce the same condition. The introduction of carbonate of soda, in large quantities, into the circulation, prevents this effect entirely. The accuracy of the opinions here advanced appears still to be challenged; consequently, the pathology of diabetes still remains a problem to be solved.

The symptoms, diagnosis, and treatment of diabetes, will be fully considered in our section on urinary disorders.

SALINE CONSTITUENTS OF THE BLOOD.

The average amount of the salts, collectively, in normal blood, is estimated to be from 7 to 8 in 1,000 parts. The more important of the saline constituents are chloride of sodium, carbonate of soda,

chloride of potassium, phosphate of soda, and sulphate of potassa. Our knowledge of their physiological changes and uses is comparatively very obscure, yet they are evidently essential in supplying matter required for the several tissues, and for various secreted fluids. They are concerned in the preservation of the red globules, and the alkalinity of the blood, the solution of albumen, the regulation of the passage of liquids through the coats of the vessels, the processes of endosmosis, exosmosis, etc.

The alkaline salts have been observed to undergo considerable fluctuations in disease. In inflammations they are decreased, and in the exanthematous and continued fevers, increased. In cholera, especially, the saline constituents are remarkably diminished, but, on the contrary, in acute, eruptive fevers, dysentery, Bright's disease, and particularly dropsy, or hydrœdema, they are considerably increased. The pathology of diabetes and articular rheumatism is thought to involve a deficiency of alkalies in the blood. This condition is supposed by Garrod to be concerned in the deposition of uric acid in gout. His researches appear to show that a deficiency of potassa constitutes an important element in scorbutus.

URÆMIA.

Uræmia is a morbid condition of the blood, characterized by an undue accumulation of urea. This principle, as well as all other excretory products, is pre-formed in the blood, and not within the glands, as was formerly supposed. Its undue accumulation in certain affections of the kidneys has been proved by direct observation. The urine is one of the chief depurating secretions by which the normal condition of the blood is maintained. When, from any cause, the function of the kidneys becomes impaired or suppressed, urea is no longer eliminated by these organs; and it therefore accumulates in the blood, constituting uræmia. Hence, it is observed in nephritis, acute albuminuria, Bright's disease, etc. In all cases in which uræmia exists, it is a consequence of the excretory function of the kidneys being either arrested, or inadequate to a proper elimination of urea.

The average proportion of the constituent principles of healthy urine, as given in the following table by Dr. Oldshue, in his work on Urino-Pathology, may be adopted as the standard:

Water,		956	parts in 1,000 of	Urine.
Organic matters, 30 } Solid Matters.		"	"	"
Fixed salts, 14 } Solid Matters.		"	"	"

The organic matters are composed of the following:

Urea,	14.5	parts in 1,000 of	Urine.	
Uric acid,	.4	"	"	"
Extractives,	14.	"	"	"
Mucus,	.2	"	"	"
Muriate of ammonia,	.9	"	"	"
	30.0			

The fixed salts are as follows:

Chloride of sodium,	7.3	parts in 1,000 of	Urine.	
Phosphoric acid,	2.2	"	"	"
Sulphuric acid,	1.8	"	"	"
Lime,	.3	"	"	"
Magnesia,	.2	"	"	"
Potassa,	2.	"	"	"
Soda,	.2	"	"	"
	14.0			

From the preceding table, it will be seen that the average quantity of urea contained in the standard of healthy urine is fourteen and five-tenths in one one thousand parts. When an excess of this substance occurs, constituting uræmia, the specific gravity of the urine will be increased, and the urine appears almost like a moderately-strong solution of saltpetre, with a little coloring matter added. In some diseases, in which this condition exists, the urine has been observed to contain more than thirty parts of urea in athousand.

Minute traces of urea are thought by some pathologists to be always present in a normal condition of the blood, existing in an infinitesimal quantity. In some diseases, however, when the functions of the urinary organs are interfered with, this excretory product may be found in a sufficiently large quantity to be weighed. When this condition exists, the blood is characterized by a deficiency of albumen in the serum. Christison, who has diligently studied the blood in this affection, describes it, in the first stage, as coagulating with a thick, fine, and cupped buffy coat. The serum is usually rather turbid, and, when shaken with ether, yields a small quantity of solid fat. The decrease in the density of the

serum in this stage is very remarkable. In healthy blood, it is estimated at 1029-1031, but in uræmia, it sinks to 1020, or even 1019, and in connection with this circumstance, we find a large quantity of albumen in the urine. The presence of a certain quantity of urea in the serum is another remarkable peculiarity. The following changes occur in the progress of the disease:—An excess of fibrin, the clot frequently constituting one-fourth of the blood. The density of the serum returns to its normal state, or even exceeds it. The urea disappears as the disease progresses, but towards the termination of the case it usually reappears, in even a larger amount than previously. The fibrin, which is increased in the first stage, diminishes, and returns to a normal condition, and is not increased again, excepting during inflammatory complications. Finally, in the advanced stage, there is a great decrease of blood-corpuscles, frequently amounting to only one-third of the normal proportion. In a case of Bright's disease, the blood, as analyzed by Simon, was as follows:

Water, ...	830.590
Solid constituents, ...	169.420
Fat, ...	2.403
Fibrin, ...	7.046
Albumen, ...	103.694
Globulin, ...	40.151
Hæmatin, ...	3.808
Extractive matters and salts, . . .	12.348

The blood, in this case, was taken from a man aged forty. Traces of urea were detected in the extractive matters, by the following method, recommended by Figuier, which is a very simple one for determining some of the most important constituents of the blood: On the addition of two parts of a solution of sulphate of soda, of a specific gravity of 1.130, to one of blood, Figuier found that the whole of the corpuscles remain on the surface of the filter. The fibrin is removed by whipping, and then dried and weighed. The weight of the corpuscles is ascertained by the method indicated, that of the albumen, by coagulating, the filtered solution, by means of heat, and the proportion of water, by evaporating a small known weight of blood.

The following are the results of Andral and Gavarret's analysis of the blood in a case of the same disease:—

Water, ...	801.0
Solid constituents, ...	199.0
Fibrin, ...	1.6
Blood-corpuscles, ...	127.6
Residue of serum, ...	69.1

Pathology.—The phenomena of uræmic poisoning have formerly been ascribed to the direct action of the urea retained in the blood. In 1851, however, Fredrichs advanced the opinion, that the urea is converted in the blood into carbonate of ammonia, through the influence of some ferment supposed to exist in this fluid, and that it only becomes poisonous after this conversion has taken place. This theory was soon overthrown by the labors of Zimmerman, Bernard, Richardson, Dumas, and others. The two highly important objections to Fredrichs' theory were, that ammonia is not an abnormal constituent of the blood; and that there is no proof that urea, while retained in the system, is converted into carbonate of ammonia. Dr. Hammond, after much observation and numerous experiments, has ascribed uræmic intoxication to the directaction of the elements of the urine retained in the blood upon the brain and nervous system, in a manner we do not yet understand. The experiments of removing the kidneys in inferior animals, have shown that the urea, under such circumstances, accumulates in the blood, and, after a time, vomiting and purging occur, and either urea or carbonate of ammonia, is found in the contents of the alimentary canal; finally, this vicarious elimination being insufficient to prevent an accumulation of urea, the toxæmia produces convulsions and coma, which are soon followed by death. The same effects take place when the excretion of urea is prevented by certain diseases of the kidneys.

Effects.—The direct effects of toxæmic poisoning, are observed in a disturbance of the action of the brain and spinal cord. These two great nervous centres may act either separately or conjointly; consequently, we have three forms of uræmic poisoning: that in which stupor supervenes rather abruptly, from which it is difficult to arouse the patient; that in which epileptic convulsions suddenly set in, and that in which the two former symptoms are combined.

Albuminuria, with uræmia, may also occur during pregnancy and

parturition. It sometimes forms a dangerous symptom in the exanthematous fevers. Pleuritis, pneumonitis, pericarditis, and peritonitis, are apt to be developed as results of uræmia. Amaurosis is an occasional result, and it is one of the pathological conditions under which neuralgia occurs. The *premonitory symptoms* are an œdematous appearance of the face and extremities, drowsiness, snoring during sleep, mental confusion, partial paralysis of sensation, debility, biliousness, chilliness, nausea, vomiting, a peculiar fœtor of the breath, owing to its being charged with ammonia, and occasional attacks of diarrhœa. The *acute symptoms* have been preceded by a chill, and particularly by complete suppression of urine. Coma or convulsions, or both combined, set in suddenly. The complexion is of a dusky tinge, the skin cold, the pupils dilated and insensible to light, the pulse slow and intermittent,, and the respiration obstructed. The breath, however, is no longer ammoniacal. All cases, however, do not present the symptoms just described, but, in all instances, there is either suppression of the functions of the kidneys, or albuminous urine.

Diagnosis.—The diagnosis of uræmia is not attended with any obscurity. It might be confounded, if care be not taken, with other diseases which it similates; as epileptic coma, hysteria, apoplexy, acholia, anæmia, and alcoholic or narcotic poisoning. The diagnosis, however, can always be correctly made by the functions of the kidneys; for, in all cases of renal coma or convulsions, we find either complete suppression of urine, or albuminuria. For treatment, see Diseases of the Kidneys.

URICÆMIA.

The late researches of Garrod have demonstrated, that healthy blood contains uric acid, only, however, in an infinitesimal proportion. When this quantity is increased, a morbid condition of the blood is produced, constituting uricæmia. It exists in gout, in which the uric acid enters into the composition of the deposit around and within the joints, in the tubules of the kidneys, and sometimes in other parts of the body.

He has also shown, that the excretion of uric acid in the urine is frequently notably diminished during a paroxysm of gout, and

that it is lessened in the chronic form of the disease. The kidneys in these affections seem to lose the power of excreting uric acid. In acute rheumatism, this principle of the blood is not increased, but in the urine it is observed in excess. Admitting that the pathological condition of gout consists in an excess of uric acid in the blood, the question arises, whether this increase be owing to an accumulation from insufficient excretion, or whether it may not be produced in too large a quantity? Garrod states, that both these conditions are applicable. He thinks, too, that the deposition of the urates is favored by a reduction of the alkaline state of the blood.

Uricæmia is also observed in some cases of lead poisoning.

Marchand calculates, (assuming that there are twenty pounds of blood in a man's body, and that one ounce and a half of urea is eliminated daily,) that the blood contains only the 15,360th part of its weight of urea.

After the removal of the kidneys, and in Bright's disease and arthritis, it is found in so large a proportion, that its detection is accomplished with little difficulty. Nitric and oxalic acid may be used in microscopic researches regarding the presence of uric acid in the blood.

HYPERINOSIS.

Hyperinosis consists of an abnormal increase of the fibrin of the blood. The average proportion of this substance in normal blood is about two and a half parts in one thousand. The blood occurs in a state of hyperinosis in all inflammatory affections, in which cases the amount of fibrin varies from three to twelve parts. This state is more decidedly exhibited in pneumonitis, acute articular rheumatism, and capillary bronchitis, than in any other form of inflammation. The largest quantity ever discovered by Andral and Gavarret never exceeded 10.5, that being its maximum. This increase may occur as extensively in feeble and sickly constitutions, as in the strong and vigorous. It is produced by the development of the inflammation as an intercurrent affection in the course of diseases.

The *chemical* characters of the blood in this condition are, an ex-

cess of fibrin, a proportionate decrease of the corpuscles, an increase of fat, and in proportion to the two latter changes, the whole solid residue will be diminished.

HYPINOSIS.

An abnormal diminution of the fibrin of the blood, constitutes hypinosis. This condition occurs less frequently than hyperinosis, but probably constitutes a much graver one. It is a frequent accompaniment of continued fevers, uncomplicated with acute inflammation. The amount of decrease is in proportion to the degree of exhaustion of the vital forces or adynamia. In the eruptive fevers it occurs less frequently. The quantity is generally above the normal average in measles, owing to the cutaneous inflammation. In rubeola, the quantity is normal, but in scarlatina it is somewhat decreased. In intermittent fevers, it is not diminished.

ACHOLIA.

Human bile is a complex fluid, being yellow, greenish, viscid, bitter, and nauseous. It has a specific gravity of 1018, and when perfectly fresh is neutral. Its secretion is constantly going on, though most actively during the digestive process. According to Bidder and Schmidt, the daily quantity secreted is about two and a half pounds, in an adult weighing one hundred and forty pounds. Its constituents, according to Muratori, are as follows:—Glycocholic and taurocholic acid, biliverdin, or coloring matter, cholesterin, a crystalline fatty matter, a resinous or waxy material, sugar, and inorganic matter, principally soda, potash, and iron.

Bile may be considered as possessing both excrementitious and recrementitious principles. The coloring matter, and the salts, do not exist pre-formed in the blood, but are produced within the liver. Cholesterin, however, exists in the blood, and we have reason to believe is excrementitious, its sources being the disassimilation of nervous tissue. It is contained more abundantly in the venous blood coming from the brain, than in the arterial going to that organ. In the portal vein, it is found in greater quantity than in the hepatic, which fact, together with that of its presence in the bile, proves that the elimination of this substance is one of the functions of the liver. It is converted into stercorin when it ap-

pears in the fæces. Leucine and tyrocine have been observed in bile, and it is possible they are excrementitious, but their pathology is as yet somewhat veiled in obscurity.

Cholæmia is a morbid condition of the blood, characterized by the presence of bile. In a preceding part of our work, we described it under the name of jaundice, or icterus. It is distinguished by the yellow or greenish tinge of the skin and conjunctiva. The bile is eliminated by the kidneys, and therefore found abundantly in the urine. Generally, the condition depends on obstruction of the passage of bile from the liver to the duodenum. It rarely accompanies cirrhosis, fatty deposit, carcinomatous and tuberculous exudation, etc. *Acholia*, or the non-secretion of bile, may give rise to a morbid condition of the blood, much more serious in its effects than that of cholæmia, or the re-absorption of bile. There are grounds for believing that the accumulation of cholesterine gives rise to a special form of blood-poisoning, or toxæmia, to which the term *cholesteræmia* is applied. The grave results of acholia may be explained in this way, and it must be remembered that this condition is not necessarily associated with cholæmia or jaundice. In the one case, we have retained in the blood those substances by the metamorphosis of which bile is produced, and in the other, the blood containing the bile itself.

Symptoms.—The essential symptoms of acholia are abnormal conditions of the nervous system. Generally, there is a first stage of excitement, characterized by noisy delirium and convulsions, which are soon followed by those of the second; depression, marked by somnolence and coma. The first stage may be absent, and a typhoid prostration ensue, which soon passes into coma. The following symptoms are also characteristic of acholia:—Petechiæ and ecchymoses of the cutaneous surface, hemorrhage from the mucous membrane of the stomach and intestines, and occasionally jaundice.

HÆMATOZOA.

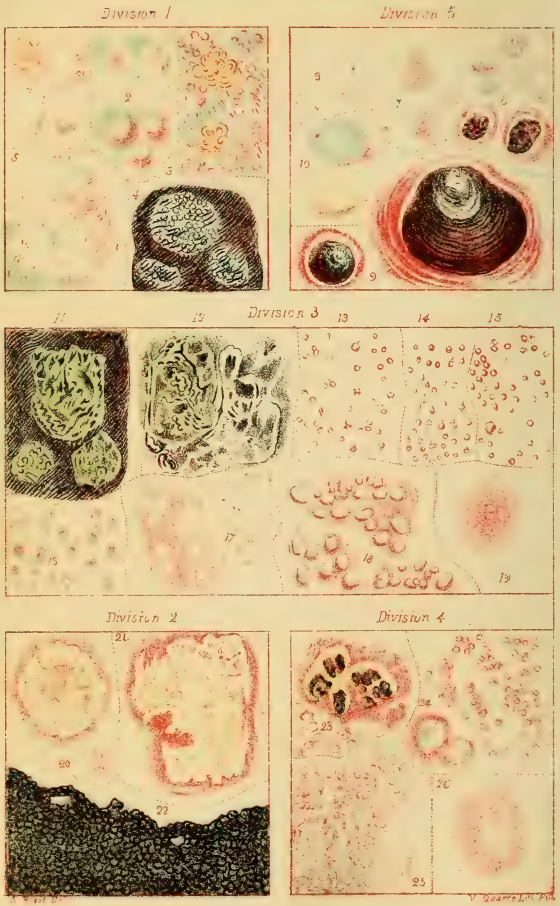
From the time of Pliny, cases are recorded of the presence of living animals in the blood. Dr. Chiaje, of Naples, has recently stated that he observed the polystoma sanguiculum in the expectorated blood of two phthisical patients attacked with hæmoptysis. Some of these small flat worms, which are similar to leeches, were

floating about in the serum, while others were attached to the sides of the vessels. Dr. Goodfellow records a case, in which an immense number were observed, varying in length from 1-500 to 1-300 of an inch, in the blood of a patient attacked with fever. Bushman observed hæmatozoa, about half an inch long, in the blood of a boy laboring with influenza.

The *distoma hæmatobium* was first discovered by Bilharz, in Egypt, in 1851. These parasites are prevalent in those persons who drink the unfiltered waters of the Nile, and who consume fish from this river, in a half putrid state. They have a flat, elongated body, with a cylindrical tail, and infest the vena portæ, bladder, and the mesenteric, hepatic, and intestinal veins.

The *symptoms* are those of general constitutional disturbance, with chlorosis, pyelitis, bloody urine, etc. The *hexathyridium venarum* has been detected in venous blood, and in the expectoration of persons suffering from hæmoptysis. Andral discovered true hydatids in the pulmonary veins of a man aged fifty-five, which were, however, probably introduced through some perforation in the walls of the vessel.

CUTANEOUS DISEASES



SECTION X.

DISEASES OF THE SKIN.

EXPLANATION OF PLATE 35.

Division 1.

Fig. 1. The upper part of this cluster of figures is intended to represent the uninflamed follicle; the lower, the commencement and progress of inflammation, and its termination in the formation of matter. 2. The enlarged and indurated tubercles, (A. indurata,) with matter formed in their centre, which occur in bad constitutions. 3. Inflamed and suppurated follicles, forming sycosis on the beard. 4. The appearance of spots of porrigo, in which no fluid secretion or scab has been formed. 5. The partially denuded scalp of long-established cases of the latter, where scabs have been allowed to accumulate, and where great irritation prevails, the remaining hairs insulated by pustules.

Division 2.

Fig. 20. The two inferior spots representing the first appearance of the spots of lepra, before the first scale separates. The superior large, round, and scaly; the disease in a spreading state. 21. Psoriasis. 22. An enlarged representation of the morbid and discolored cuticle, forming ichthyosis. The numberless fissures caused by the cracking of this hard, dry substance, and dividing it into thousands of pieces, are well represented.

Division 3.

Fig. 11. Porrigo favosa. 12. P. larvalis, both from cases of considerable standing. 13. The pimples of infants, some of them surrounded by considerable inflammation; their representation in clus-

ters connected by patches of inflamed skin, (S. intertinctus, &c.,) has been omitted. 14 and 15. The pimples of adults, termed lichen; the first of these, as it sometimes occurs on the arms and other parts covered by the finer kind of hair, each hair occupying the centre of a pimple; the second, as it appears on other parts. 16. The pimples of prurigo, the tops of some of them scratched off, leaving a peculiar, little, black, bloody scab on their apices. 17. Two of the common forms of urticaria. 18. The vesicles of impetigo in an advanced and partly flaccid state. 19. The carbuncular furuncle.

Division 4.

Fig. 23. The inferior portion, exhibiting an enlarged view of the vesicles of impetigo. The superior, the disease in an advanced stage, with the scab partially covering it. 24. The vesicles and enlarged pustules of the itch. 25. The appearance of the skin in eczema mercuriale. 26. The tubercle of erythema nodosum.

Division 5.

Fig. 6. Petechiæ, or purpura simplex. 7. The enlarged spots of purpura hemorrhagica. 8. Different stages or degrees of the ecthymatous eruption. 9. The conical scabs of rupia. The similarity of character between the two latter, is rendered very distinct. 10. Pompholyx. The superior vesicle is discolored by the admixture of blood from the vessels of the surface.

CLASSIFICATION OF SKIN DISEASES.

There are few diseases in which there is more confusion relative to their arrangement, than diseases of the skin. In the plate representing skin diseases, I have endeavored to so arrange them that all the forms could be viewed at a single glance. In order to do this, I was under the necessity of arranging them under the head of five distinct divisions, which, although not representing all the minute subdivisions of dermatologists, shows every form of skin affection in some stage of the disease, which has fallen under my notice.

In the classification of integumentary, or skin diseases, I shall adopt that which has been arranged by Willan, considerably modified; not that I consider this arrangement free from objections, but

because it is that which is ordinarily adopted by medical writers and teachers, and may enable us to study these divisions as well as any other system that we could adopt.

The different orders are as follows:—

Order 1. *Papulæ.*—Strophulus; lichen; prurigo.

" 2. *Squamæ.*—Lepra; psoriasis; pityriasis; ichthyosis.

" 3. *Bullæ.*—Pemphigus; rupia.

" 4. *Vesiculæ.*—Herpes; eczema.

" 5. *Tuberculæ.*—Elephantiasis; molluscum; acne; lupus; frambæsia; keloid; vitiligo.

" 6. *Pustulæ.*—Ecthyma; impetigo.

" 7. *Parasitici.*—Tinea tonsurans; tinea favosa, or porrigo; tinea decalvans; tinea sycosis; tinea versicolor; scabies; entozoon folliculorum.

" 8. *Maculæ*—Ephelis; nævus; albinism.

The order, *exanthemata*, has been described in a preceding section; hence, it is omitted here.

The distinctive features of the eruption by which these orders are characterized, are defined as follows:—

Papula, (Pimple.)—A very small and acuminated elevation of the cuticle, with an inflamed base, not containing a fluid, nor tending to suppuration.

Squama, (Scale.) A lamina of morbid cuticle, hard, thickened, whitish, and opaque.

Bulla, (Bleb.)—A large portion of the cuticle detached from the skin by the interposition of a transparent, watery fluid.

Vesicula, (Vesicle.)—A small, orbicular elevation of the cuticle, containing lymph, which is sometimes clear and colorless, but often opaque and whitish, or pearl-colored.

Pustula, (Pustule.)—An elevation of the cuticle, with an inflammatory base, containing pus.

Tubercula, (Tubercle.)—A small, hard, superficial tumor, circumscribed and permanent, or proceeding very slowly to suppuration.

The order *parasitici*, is characterized by the presence of parasites.

Macula, (Stain.)—A permanent discoloration of some portion of the skin, often with a change of its texture, but not connected with any disorder of the constitution.

ORDER I.—PAPULÆ.

Strophulus.—This form of papular disease, commonly known as red gum, or tooth rash, is confined chiefly to young infants, appearing usually before, or during the first dentition. It is characterized by an eruption of minute, hard, clustered, or scattered pimples, which may appear upon a part, or extend over the whole surface of the body. The papulæ may be white or red. In its most common or simple form, *strophulus intertinctus*, small, red pimples, appear a short time after birth, mingled with slight erythematous patches. In other cases, the papulæ are white and large, often resembling flea-bites, which constitutes the variety *strophulus candidus*. In another form, *strophulus volaticus*, or *wild-fire rash*, the eruption appears in small, circular, bright red patches, occurring in groups, which manifest themselves successively in different parts of the body.

Strophulus, in all its forms, is of little moment. It is due to stomach or intestinal derangement, resulting from improper food, or of irritation about the gums from dentition. Too great exposure to heat, rough flannel next the skin, and the accumulation of filth upon the surface, may give rise to it. The eruption is usually preceded by itching, is slowly formed, and occurs without any observable disturbance of health; sometimes, however, fever is present. It varies in its duration from a week to several months.

Treatment.—The treatment of strophulus consists in correcting the disordered condition of the stomach, by neutralizing cordial, warm baths, removing irritating substances from the skin, and in case of extensive irritation, the surface may be bathed in a little lime water and sweet oil.

Lichen.—Lichen consists of numerous small papulæ, of a reddish hue, or of the color of the skin, collected in groups, or scattered over the entire surface. According to Willan, there are seven species of this eruption.

Lichen Simplex is seldom accompanied by any constitutional disturbance at its commencement. The papulæ are small and numerous, of a bright red color, and scattered in closely set groups over the skin. The eruption is attended with much heat and tingling, remaining until the papulæ have disappeared. It may be either

acute or chronic; in the former, the disease continues for about a fortnight; in the latter, it may last for months, or even years. The size of the papulæ varies according to the portion of the body on which it appears. In the weak and aged, the eruption is of a livid color, frequently accompanied with red stains of the skin.

The papulæ are in patches, instead of being scattered over the surface. In young persons the itching is sometimes severe, while the papulæ are very much increased in size.

Lichen simplex is sometimes mistaken for rubeola, or for scarlatina. *Lichen pilaris*, or hair lichen, is a modification of the preceding, the papulæ occurring exclusively at the roots of the hair. In persons of scorbutic habit, or hemorrhagic diathesis, they are apt to have a purplish, or livid hue, constituting the variety *lichen lividus*. This form of lichen is frequently due to derangement of the stomach, especially such as arises from the abuse of alcoholic drinks. *Lichen circumscriptus*, or clustered lichen, is characterized by patches of papulæ, which have a well-defined margin, and an irregularly circular form. It is sometimes produced in adults by vaccination.

Lichen agrius, or wild lichen, sometimes follows lichen simplex; but in most cases its phenomena are seen from the first, in which event, smart febrile symptoms occur two or three days previously, and with such a burning heat as to resemble scarlatina. As the rash appears, the fever diminishes, while numerous small and shining papulæ are seen in the skin. The itching is increased by any thing which adds to the heat of the skin. In the advanced stage of the disease, the papulæ ulcerate, and discharge a serous fluid, which forms into thin scabs; the skin then becomes thicker and more inflamed, pustules of acne or impetigo are seen, and the cutis assumes a livid aspect, discharging freely a serous fluid.

In the mild cases of lichen agrius, the eruption disappears about the twelfth day, the irritation grows less, and the disease ends in about a fortnight. It may last for a much longer period; in some cases remaining four or five years. It affects particularly special portions of the body. The swelling on the face is much greater than on other parts, the eyes becoming, sometimes, almost entirely closed. The influence of heat in producing lichen agrius may be noticed; thus we see persons affected particularly in the warm

season of the year; and in hot climates, this occurs so frequently that it is accounted a separate variety, under the name of *lichen tropicus*, or the *prickly-heat* of the East Indies, partly due to exposure during the heat of the day, before the system has become acclimatized. *Lichen urticatus*, or nettle lichen, characterized at its commencement by the occurrence of wheals resembling those produced by the bites of poisonous insects. These soon subside, however, and leave papulæ, which are sometimes obstinate, both wheals and papulæ being accompanied with intense itching, pricking, and tingling.

Diagnosis.—Lichen simplex may be easily known by the appearance of the erythema. It is likely to be mistaken for prurigo, the first appearance of the eruption being the same in both; but in prurigo the papulæ are much larger than in lichen. When these begin to disappear, the eruption might be confounded with psoriasis guttata, except that the scales are thinner and smaller. It may be distinguished from scabies and eczema by the free discharge attending them. Lichen circumscriptus may be distinguished from herpes circinatus and erythema circinatum, by the character of the eruption. The distinguishing features of urticaria and lichen urticatus are the pale centres of the elevations, and the nature of the former is to pass quickly away.

Lichen strophulus may be distinguished from prurigo by the white papulæ in the former being paler, while the red forms are of a deeper color than those in prurigo. They also occur at different ages.

It is sometimes difficult to detect a difference between lichen agrius and chronic eczema; but in the first-named eruption we can readily distinguish the character of the papulæ. In this form, moreover, the serous discharge is less abundant.

Lichen is a very frequent form of syphilitic and mercurial eruption, which I have fully described under that head.

Prognosis.—The prognosis of lichen is almost always favorable under the New School treatment; although on old people, and mercurial and syphilitic patients, it sometimes proves an obstinate form of disease.

Treatment.—The treatment, in the acute form of lichen, consists in cleansing the stomach and bowels by means of a gentle emetic

and a mild purge, after which the following remedies should be given:—Take the saturated tincture of scrophularia marilandica, one dram, add to it a tumblerful of water, and let the patient take one teaspoonful every half hour, or hour. If there be fever, twenty or thirty drops of the essential tincture of veratrum viride should be added to another tumbler partly filled with water, and a teaspoonful given in alternation with the above remedy, every half hour, or hour, until the fever is controlled. During the treatment, the surface should be frequently sponged in tepid water, and the patient remain quiet in bed. If the above treatment should not control the disease in from twenty-four to forty-eight hours, the following should be given:—Take macrotin, one grain; quinine, ten grains; hypo-phosphite ferri, twenty grains; mix. Make fifteen powders. Dose, one every two hours. As an external application, biborate of soda, dissolved in water, of moderate strength, is all that is required in simple lichen. It may be applied as a wash three or four times a day. In the chronic form of the disease, an active, supporting, and invigorating course of treatment is requisite. The following compound will be found valuable:—Take chimaphilin, one dram; ampelopsin, one half dram; pyro-phosphate ferri, one and a half drams; syrupus simplex, six ounces: mix. Dose, one teaspoonful every two or three hours. At the same time the patient should take a nourishing diet, frequent out-door exercise, in connection with daily baths, and the following local application should be made:—Take oxide of zinc, one dram; sulphate of sanguinarina, ten grains; glycerine, two ounces; white wax, one half ounce; mix, and form an ointment, to be applied to the eruption once or twice a day. If there should be much itching, and a burning sensation experienced, one dram of the essential tincture of aconite, added to two ounces of glycerine, and applied as an ointment, will relieve that symptom. If the disease should still prove obstinate, ten grains of quinine, and three grains of juglandin, made into six powders, and one given every two or three hours, will, under ordinary circumstances, control the difficulty.

Prurigo, or Itching.—Although prurigo frequently occurs without the presence of papulæ, yet it must be arranged with the cutaneous diseases, as in some cases the eruption is distinctly visible,

appearing of a larger size than in some other affections of the skin. It consists of two distinct forms—Prurigo Vulgaris, and Prurigo Senilis.

Prurigo vulgaris, although often severe, may in some cases occur in a very mild form. The eruption is sufficient to cause an unpleasant itching on the surface.

The papulæ, in the outbreak of the severe form of this disease, may or may not occur; but they are generally visible in some stage. The pruritus occasions the most intense degree of itching, especially during the night, thus causing the skin to be torn by the almost incessant scratching of the patient.

The milder form generally lasts about three weeks, while the more severe may continue a number of months.

Prurigo senilis is confined to persons of advanced age. The papulæ are always present in this form, and are of a larger size than those of prurigo vulgaris. The skin being torn with the nails, small black crusts appear on the points of the eruption. In this form of the disease, numerous pediculi are constantly found on the surface of the skin, especially on persons in lower life, and those of unclean habits. The eruption is consecutive, new ones beginning to appear as soon as others are removed.

Prurigo vulgaris may occur on particular portions of the body, taking its name from the parts which it affects.

Causes.—This disease may occur at any period of life, although it is most frequent in very old persons. It is especially liable to occur upon the pudenda in females, about the change of life. In cases where the skin is subject to frequent irritation from trifling causes, the disease is likely to be developed. Dissipated habits, want of cleanliness, unwholesome diet, etc., all act as exciting causes.

Diagnosis.—The extreme papular eruption is the most prominent symptom of prurigo, together with the black crusts which form on the papulæ. It is liable to be mistaken for scabies and lichen, as has been before stated.

Prognosis.—When prurigo has been of long standing, it is difficult to combat, especially in those of advanced life. Although it is not deemed fatal, yet it, in many cases, affects the mind, and

renders the remaining days of the patient a burden. Under proper treatment, however, it is usually controlled.

Treatment.—In the simple form of acute prurigo, the following application is usually all the treatment required:—Take oleo-resin of lobelia, twenty grains; aconitin, three grains; sulph. sanguinarina, ten grains; glycerine, two ounces; mix. Triturate and form an ointment. Apply it to the part three or four times a day.

In the chronic form of the disease, when the constitution is vitiated, iron, quinine, juglandin, and general tonics, will be required. If occurring on the pudendum, I have found the following application of great value:—Take iodide of potassium, one dram; water, one ounce; mix, and bathe the parts three or four times a day. If there be much inflammation connected with the disease, a slippery elm poultice may be applied, moistened with the glycerine ointment described above.

ORDER II.—SQUAMÆ.

Squamous eruptions may be said to consist of dry, hard scales, occurring in groups on the surface of the skin. Scaly diseases chiefly affect the extremities, although they may occur on any portion of the body. They may be divided into four varieties, psoriasis, lepra, pityriasis, and ichthyosis.

Psoriasis, (Dry Tetter, Dry Scale.)—Psoriasis consists in the production of dry, white scales on the surface of the skin, which separate into small layers. The eruption is scattered over the surface, in the form of small, round spots, formed into groups. There are two varieties of psoriasis, viz: Psoriasis Guttata, and Psoriasis Aggregata.

Psoriasis Guttata.—In this mild form of the disease, there is a slight degree of itching, with numerous small papulæ appearing at the commencement of the affection. This form of psoriasis usually lasts from six weeks to two months. Sometimes the eruption appears in narrow strips, which are nothing more than the papulæ crowded together in a small space.

Psoriasis Aggregata.—This form, like the previous one, is usually developed without much constitutional disturbance. The erup-

tion consists of slight elevations of the cuticle, closely aggregated together, which soon become covered with a dry, briny scale, and desiccate and desquamate every day, and sometimes oftener.

Causes.—Psoriasis occurs at all ages, and in both sexes. It is said to depend frequently upon hereditary predisposition. It is also caused by irritants applied to the surface, but is more probably the result of the inactivity of cutaneous exhalation, and the accumulation of detritus in the blood.

Diagnosis.—Various forms of psoriasis may be distinguished from all other eruptive affections, with the exception of pityriasis, by the presence of squamæ, or scales. From the latter, it is distinguished by its surface being elevated.

Treatment.—As this disease depends upon the imperfect action of one or more of the emunctories of the body, the physiological condition of these organs should be carefully studied. If the skin be inactive, baths, friction, out-door exercise, with a free use of fresh vegetable diet, and two or three grains of chimaphilin, administered two or three times a day, will be sufficient to remedy the difficulty. If the disorder be dependent upon a diseased condition of the kidneys, apocynin, barosmin, and helonin, are the remedies. To act specifically upon the affection, quinine and juglandin should be given. As an external application, the acetic tincture of sanguinaria canadensis, applied five or six times a day, will be found most beneficial. In some cases, I have derived benefit by applying the wash during the day, and covering the part with glycerine, at night. During the treatment, the bowels should be kept regular, by means of anti-bilious physic and neutralizing mixture, and the parts kept free from irritating substances. Bathing the parts in Mecca oil, four or five times a day, has also proved valuable. Equal parts of Goulard's solution of lead and glycerine, also form a good application.

Lepra, or Leprosy.—Lepra, or leprosy, is a non-contagious chronic eruption, consisting of red and scaly circular patches, of various dimensions. In some instances, these patches coalesce, and form an extensive eruption; or they may remain distinct, appearing on all portions of the body. The eruption, usually, first appears on the limbs, from which it spreads to the trunk, and not unfrequently

the scalp. When the patches are of moderate size, round, and reddish, and covered with thin, white scales, the affection is termed *lepra vulgaris;* when smaller and whiter than the preceding, and of long continuance, *lepra alphoides;* when of a dark, livid color, *lepra nigricans;* and when copper-colored, and the result of syphilis, *syphilitic lepra.*

The duration of lepra is very indefinite. It may disappear spontaneously, or may continue for months, and even years. The cause is similar to that of psoriasis. It occurs more frequently in adults, than children, and in men, than women.

Diagnosis.—It is distinguished from psoriasis guttata, by the smaller patches of that affection, their less regularly circular form, and their want of depression in the centre. The scales appear and disappear the same as in psoriasis, with the exception of lepra nigricans, in which they have a tendency to accumulate, forming quite an elevation on the skin.

Pityriasis.—Pityriasis or dandruff, may be divided into *pityriasis diffusa*, and *pityriasis localis.* (See div. 2, skin diseases, fig. 21.) Pityriasis diffusa, is characterized by patches of yellowish, or reddish-yellow color, covered with fine, branny scales, accompanied by smarting, itching, and burning. Pityriasis localis does not differ from the other form, the term only alluding to its peculiar location. It may appear on the face, neck, scalp, and other portions of the body.

Causes.—The causes of this form of squamæ are, unquestionably, similar to those of psoriasis.

Diagnosis.—The only disease with which it is liable to be confounded is that of psoriasis, from which it may be distinguished by the scales being much smaller, finer, and the surface less elevated than in psoriasis.

Treatment.—The treatment, so far as the constitutional symptoms are concerned, differs but little from that which I have already described under the head of psoriasis. As a local remedy, I have found almost immediate relief by applying a warm solution of the sesquicarbonate of potassa; say, take of the potassa, one-half ounce; boiling water, half a pint. Let cloths be wrung from this hot solution, and applied to the part, as warm as the patient can bear them; have

them changed every half hour or so, during the day. At night, cover the part with the following mixture:—Take glycerine, two ounces, hydrastin, ten grains. Mix, and use as an ointment. If the case should prove obstinate, and especially if confined to the scalp, the acetic tincture of sanguinaria should be used, as described under the head of psoriasis.

Ichthyosis.—(Div. 2, fig. 22, skin diseases.) Ichthyosis, or fish-skin disease, is characterized by thick, dry, horny scales, appearing on portions of the body. If the disease continue, it may extend over the entire surface. The entire integument is usually involved, and the skin has a hard and thickened appearance. These scales generally dry and fall off, but they are soon supplied by the formation of new ones.

Causes.—But very little is known as to the cause. In many instances it is congenital, while in other cases, it appears to depend upon a general derangement of the skin, and vitiated state of the fluids.

Treatment.—A variety of plans of treatment have been introduced, but, in most instances, with but little success. Dr. Banks reports two cases that he cured by the free use of cod liver oil, internally and externally. This fact would go to show that the disease may be dependent upon disordered nutrition; and, in the numerous cases that have been successfully treated by the New School practitioners, I notice that the cures have principally depended upon the correction of the nutritive functions. Cod liver oil, alnuin, chimaphilin, quinine, and iron, being the remedies mostly administered internally; while hydrastin and sanguinarina, triturated in cod liver oil, have been most successfully used as an external application. In addition to the above treatment, iodide of potassium, iodide of ammonia, corrosive sublimate, arsenic, sarsaparilla, dulcamara, arctium lappa, and menispermin canadensis, have been highly recommended by various practitioners. We, however, apprehend that the mercurial and arsenical remedies can be dispensed with where other treatment is properly administered.

ORDER III.—BULLÆ.

Pemphigus, (Watery Blebs.) (See plate 1st, skin diseases, division 4th, fig. 23.)—Acute Pemphigus is ushered in with febrile symptoms and general malaise, loss of appetite, and derangement of the secretions, which, on the second or third day, are followed by an eruption on the thighs and lower part of the abdomen, of a bright red color, usually accompanied with a smarting or burning sensation. In the centre of this eruption a minute vesicle appears, which rapidly extends until it covers nearly, and in some cases the entire inflamed patch. These blisters are at first round, and of a bright transparency. In the course of from twenty-four to forty-eight hours the fluid contained in the vesicle becomes opaque, the bullæ break, the fluid escapes, leaving a red and excoriated surface, which soon becomes covered with a yellowish, thin scab, which falls off in from five to six days. In some instances, several successive crops of these blisters occur, which pass through the same process. Dr. Willan has described two forms of pemphigus, which are modifications of this—such as *pemphigus pompholyx*, where the fever is severe, and *pompholyx benignus*, when the fever is mild. Pemphigus chronicus is the name given to the disease by Dr. Neligan, when it is of long standing.

Causes.—The causes of pemphigus are always connected with constitutional derangements. It is produced by bad diet, by the long-continued use of poisonous mineral medicines, and, in short, any thing that tends to debilitate the constitution, and vitiate the fluids.

Pathology.—Pemphigus is an inflammation of the superficial layers of the derma, which result in the effusion of serum and the formation of blebs.

Treatment.—The treatment of pemphigus depends much upon the cause, which should be carefully sought, and, as far as practicable, removed. The surface of the body should be bathed, the bowels opened by means of one or two grains of apocynin, and the inflamed surface covered with a slippery elm poultice, kept moist with the tincture of lobelia. When the constitution is feeble, iron, chimaphilin, quinine, cod liver oil, and alnuin, should be given in such quantities and combinations as the nature and constitution of

the disease may require. When pemphigus occurs in children, it is more frequently than otherwise dependent upon deficient nutrition; and in order to successfully treat the malady, special attention should be given to the diet and habits of the patient; fresh air, out-door exercise, and frequent bathing, being *essential* auxiliaries in the treatment.

Rupia.—Rupia is a small blister, or vesicle, the size of a chestnut, which appears upon the inflamed base, and contains from the first an ichorous, semi-opaque fluid, which dries into a dark-brown crust, falls off, and leaves an indolent ulcer. (See division 5, figs. 9 and 10, plate of skin diseases.) Rupia has been divided into simple and prominent; but as there is no practical importance connected with this division, we omit it.

Causes.—This disease is always connected with a vitiated constitution, and is dependent more frequently than otherwise upon imperfect diet; although chronic diseases, such as syphilis, phthisis, dyspepsia, and poisonous medicines, not unfrequently produce it.

Diagnosis.—The only diseases with which rupia is likely to be confounded, are pemphigus and ecthyma. From pemphigus it may be distinguished by its seldom having more than one bleb, or blister. In pemphigus they are numerous. Ecthyma is an inflammatory pustular eruption, and the scabs formed are flat and small.

Treatment.—As rupia might be considered more as a symptom of some other disorder than an idiopathic disease, the principal indications of treatment consist in removing the constitutional affection upon which rupia depends, such as correcting the digestive organs, nourishing and enriching the blood, &c., &c. The local applications should consist of emollient poultices, kept constantly moist with the tinctures of hydrastin, baptisin, and myrrh. When rupia degenerates into an indolent ulcer, in connection with the constitutional treatment, the parts should be washed once or twice a day in a weak solution of sulphate of zinc, and a poultice applied, composed of equal parts of pulverized bayberry, white pond lily, and slippery elm. The diet should be of a nutritious character, and the system invigorated by frequent baths, friction, and fresh air.

ORDER IV.—VESICULÆ.

HERPES.—Herpes is a transient, non-contagious eruption, consisting of circumscribed red patches, upon each of which is situated clusters of vesicles. In all its forms the disease is essentially mild, and always terminates favorably, unless accompanied by some constitutional vice.

Sudden exposure to cold after violent exercise, the direct action of irritants, strong mental emotions, bodily fatigue, impoverished diet, friction and irritation from clothes, and a vitiated state of the system, may be mentioned among its causes.

Diagnosis.—The only disease with which it is likely to be confounded in eczema, from which it is distinguished by the vesicles being larger, more globular, and the patches better defined.

Herpes has been divided into *Herpes Phlyctænodes*, *Zoster*, and *Circinatus*. Herpes phlyctænodes is characterized by an eruption of small, transparent, round vesicles, in irregular, circumscribed patches, preceded and attended by slight constitutional disorder. It appears most frequently on the forehead, cheeks, neck, arms, or breast. After a protracted intermittent or remittent fever, this species appears on the lips, and in females on the outer lips of the pudendum. It is characterized by a smarting, burning pain on a small patch of the skin, which, in the course of twenty-four hours, becomes covered with small blebs, or vesicles, containing a colorless or pale citron-colored serum, or that of a brownish hue in the aged or cachectic, which usually becomes opaque and muco-purulent, and is discharged in the course of two or three days, forming dark-brown scabs, which desiccate about the tenth day. The surface affected retains a red or livid color for some time, and continues the seat of pricking or smarting pains. This eruption usually assumes an acute form, and terminates within two weeks. It is usually preceded by flatulency, distention or oppression of the stomach, febrile excitement, and unhealthy excretions, which, upon the appearance of the eruption, frequently become aggravated by the heat and tingling of the successive groups of vesicles.

Herpes Zoster, *Zona*, or *Shingles*, differs from the preceding variety in the size of the vesicles, in the seat of the eruption, and in the manner in which the clusters successively appear. The clusters

are situated upon the side of the trunk, and are arranged in succession, forming an irregular band, encircling half the circumference of the body. They very rarely advance perpendicularly. The right side is more frequently affected than the left. The row of clusters occupies the neck, or the side of the head. Sometimes the patches ulcerate, and tedious sores result from the friction of the clothes. In cachectic persons, and in the aged, the vesicles often enlarge into bullæ, which soon break, suppurate, or even ulcerate.

Shingles is preceded by febrile rigors, an accelerated pulse, general uneasiness, lassitude, headache, anorexia, thirst, disturbance of the digestive apparatus, an unhealthy condition of the excretions, darting pains across the chest, scalding heat, and smarting and burning pains at the site of the eruption.

Herpes Circinatus, or *Ringworm*, is characterized by the occurrence of the vesicles in circular patches. In its common form, they appear at the circumference, constituting a ring, with a portion of skin free from eruption in the centre. It usually appears on the face, neck, arms, and shoulders. The vesicles are generally very minute, and contain a transparent fluid, appearing rapidly in the circumference of the patches, the areas becoming red. About the sixth day the redness declines, the vesicles are turbid, and burst, or else are covered with thin, brownish incrustations, which desiccate in about a week. It is seldom attended with any constitutional disorder, and the local sensations usually consist only of a moderate tingling and itching, and are much less severe than in the other forms. The ringworm occurs most frequently among children.

Treatment.—In the treatment of the simple forms of herpes, but little more is necessary than the application of some stimulating and astringent lotion, such as the following:—Take acetate of lead, ten grains; pure water, one ounce; tinct. of aconite, one dram; mix, and apply to the part five or six times a day. In cases of herpes labialis, the following paste is almost a specific:—Take sulphate of hydrastia, ten grains; glycerine, one ounce; mix, form a paste, apply six or eight times a day. In herpes zoster, the stomach should be thoroughly cleansed by the compound acetic tincture of lobelia, the bowels opened with small doses of anti-bilious physic and podophyllin; and when it is convenient, the patient should take a hot bath. If the hot bath cannot be given, the alkaline sponge

bath should be resorted to. The portion of the body covered by the eruption should be bathed in a solution of sulphate of zinc. Take sulphate of zinc, one ounce; water, one pint. If there be much inflammation, a slippery elm poultice should be applied after each bathing. If there be fever, it should be controlled by the use of aconite, or veratrum, and in case the disease prove obstinate, quinine and iron should be given. When the eruption is very severe, I have used the following ointment:—Take oxide of zinc, two drams; sulphate of sanguinarina, one-half dram; lard, one ounce; mix, form an ointment, and apply to the part, followed either by a hot pack, or a warm slippery elm poultice.

Eczema, (Scale, or Humid Tetter.)—This disease is one of the most frequent forms of skin affections met with by the physician. Dermatologists divide it into Eczema Simplex, Rubrum, Faciei, and Capitis. Eczema simplex consists in the appearance of minute, shining vesicles, not larger than the head of a small pin, on different portions of the body. They are usually clustered together, and surrounded by red areola. In from thirty-six to forty-eight hours, the fluid becomes opaque, and in from three to four days dries up, and forms light, thin scales, and desquamates. In most cases a fresh crop appears as soon as the first is matured, which develop and proceed through the same course; in which event, yellow crusts form over the diseased patch, and chronic tetter exists for weeks, or even months. In simple eczema there is usually but little fever, or constitutional disturbance, although the diseased part may be irritated and inflamed.

Eczema Rubrum.—This is a more violent form of the disease, in which there is frequently fever, and other constitutional symptoms peculiar to eruptive diseases. The vesicles are much larger; and when the fluid becomes opaque, they rupture and form large, yellow crusts.

Eczema Faciei, as the term indicates, mostly appears upon the face, and is confined generally to young children. It is frequently accompanied with fever, and assumes the general appearance of eczema rubrum.

Eczema Capitis is that form which is confined to the scalp, and

presents the ordinary characters of eczema on other portions of the body.

Diagnosis.—Eczema may be confounded with herpes, from which it may be distinguished by the following symptoms:—In herpes the vesicles are much larger, and the patches are always well defined. When it appears on the fingers, it is liable to be confounded with scabies, from which it may be distinguished by the excessive tingling and itching peculiar to itch, and the absence of inflammation around the vesicles.

Treatment.—On commencing the treatment of eczema, the bowels should be opened by means of some mild laxative, the skin thoroughly bathed, and the patient placed upon a well-regulated, but nutritious diet. After which, the following internal treatment should be instituted: Take juglandin, twenty grains; quinine, ten grains; neut. mixt., two ounces; syr. simplex, two ounces; mix. Dose, one teaspoonful every two or three hours. For children, one-half the usual quantity.

As an external application, take acetic tincture of sanguinaria, quantity sufficient to keep the part thoroughly saturated by means of lint. This treatment, if thoroughly applied, will most speedily cure all the forms of eczema. In some cases, where the part is irritable, the patient will not tolerate the lotion. In that event, I have been in the habit of applying the wash by means of a camel's hair pencil, four or five times a day, and after each application cover the part with glycerine. In case the disease should prove protracted, the quinine and juglandin mixture should be alternated with the following: Take essential tincture of scrophularia marilandica, one ounce; simple syrup, four ounces; mix, and give one teaspoonful every two or three hours. In cases where there is great local inflammation, previously to applying the sanguinaria wash, it may be subdued by means of a slippery elm poultice applied to the part, and kept moistened with the tincture of lobelia. In treating eczema capitis of young children, it is well to remove the hair, so as to enable the medicine to come in contact with the diseased part. Celandine, tar, and oxide of zinc ointments have also been used for the same purpose. I recently cured a bad case of eczema capitis, by washing the scalp twice a day in Castile soap and water, followed by a thorough application of Mecca oil.

ORDER V.—TUBERCULÆ.

ELEPHANTIASIS. There are two varieties of this disease—Elephantiasis Græcorum, and Elephantiasis Arabum. The former is characterized by the development of tumors upon the integument, varying in size from the head of a pea to that of an apple. Eventually these tumors ulcerate, and discharge an ichorus pus, in some cases affecting the bone and resulting in mortification and death. It is a disease principally of tropical climates, and is supposed to be the true leprosy of the ancients. It appears to be endemic in Lisbon. The first indication of it as observed there, is a discoloration in patches of the skin of the face, an elongation and thickening of the lobes of the ear, and a spreading out of the alæ of the nose. Then the face becomes tuberculous, the features are puffed out, the lips thicken, the whiskers, eyebrows, and eyelashes fall off. The tubercles gradually extend over the limbs, the sensibility of both body and mind becomes greatly blunted, and at length there is mere animal life. The tubercles ulcerate after some years; there is ozæna, the fingers and toes become gangrenous, and the body exhales a loathsome odor. Death results from erysipelas, diarrhœa, or exhaustion. Males suffer more frequently than females.

Elephantiasis Arabum, or Barbadoes Leg is characterized by extensive hypertrophy and hardening of the derma, producing marked deformity. The subjacent areolar and adipose tissues are occasionally implicated.

It generally affects the lower extremities; the scrotum of males, and the pudendum of females. The affection commences with more or less local inflammation, and a general derangement of the constitution; the parts affected often assuming an enormous magnitude, and when fully developed, have a rough, lightish-brown color, full of deep furrows, which ulcerate, and discharge an ichorous pus.

Treatment.—As this disease is produced by a vitiated state of the fluids, and imperfect action of the integument, tonics and alteratives should be freely administered, such as the compound syrup of stillingia, in combination with iron, &c. The parts should be thoroughly bathed three or four times a day with a strong solution of sesqui-carbonate of potassæ, followed by slippery elm poultices. In cases where the swelling and thickening of the integument have

become very extensive, painting the part with the muriated tincture of iron, followed by an astringent poultice, has been found very beneficial.

Four or five drops of Donovan's solution, administered three or four times a day, has also been highly recommended. A few cases are on record of cures having been effected by painting the part with tincture of iodine, and the administration of full doses of iodide of potassium. When it is confined to the extremities, amputation has been successfully resorted to.

Molluscum is characterized by the development on the skin of round, slightly umbilicated, soft tumors, varying in size usually from that of the head of a pea to a nut, but described as occasionally acquiring the magnitude of a pigeon's egg. They are of a yellow or pinkish-white color, rarely pedunculated, scattered irregularly over the surface, yet occurring not unfrequently in small groups, of slow growth, and unattended with either local pain or constitutional irritation. When pressed between the fingers, a small quantity of thick, whitish fluid exudes from the minute aperture that forms the umbilical apex of each tumor. They are most frequently found on the face and neck. Their duration is uncertain; in some cases, ulcerating and falling off spontaneonsly, in others lasting for life, without increasing or diminishing.

Causes.—But little is known in regard to the cause of molluscum.

Treatment.—The treatment that has been most *successful* in this disease, consists in clipping off the tumors with a pair of scissors, and cauterizing the part with a little caustic of potassæ, after which a slippery elm poultice should be applied. The constitutional treatment should be of a tonic and invigorating character.

Acne.—Acne consists of small pustules, with a hardened base, which are usually distinct, although sometimes they aggregate together, and form clusters. The pus usually appears upon the apex of the acne, while the base is red and painful. Acne may assume a chronic and indolent character, and small red pimples or eruption appear, without forming pus, which, after existing for a time, become absorbed, but only to be followed by another crop. The seat

of the disease is usually in the sebaceous glands, and has been denominated by Bennett, *entozoon folliculorum*. Dermatologists have divided acne into three varieties—*acne simplex*, *acne indurata*, and *acne rosacea*. The first two appear mostly on young persons, about the forehead or sides of the cheeks, although it may occur in other portions of the body. They are very protracted in their duration, and frequently leave indelible cicatrices. Acne rosacea attacks the nose, is often connected with some gastric or hepatic difficulty, and is mostly observed in persons of advanced years. It is commonly known as *brandy face*, or *rum blots*.

Causes.—Simple acne and acne indurata are produced by an obstruction of the sebaceous glands, and are the result of high living, and the want of proper elimination from the body. In females, it may occur about the age of puberty, and be produced by amenorrhœa or dysmenorrhœa. Acne rosacea, in males, is usually produced by the frequent use of intoxicating beverages, although it may arise from derangement of the urinary organs, stomach, etc. It also occurs in females about the change of life, and is supposed to be caused by the introduction of zymotic poison into the blood.

Treatment.—In the treatment of acne, as in other diseases, the causes should be sought for, and, so far as practicable, removed. If produced by a want of proper cleanliness or bathing, baths should be prescribed, out-door exercise, and a low diet. If dependent upon imperfect menstruation, senecin, iron and gossypiin should be given, in connection with sitz-baths, and a general tonic and invigorating course of treatment pursued. When produced by the use of wines, brandy, and other alcoholic stimulants, they should be proscribed. If connected with the change of life, the eliminating organs should be invigorated by baths and friction to the skin; leontodin, neutralizing mixture, and chimaphilin, to disgorge the liver, bowels, and lymphatics; and barosmin and populin, to invigorate the digestive organs, and facilitate elimination through the kidneys. As a local application, I have found aqua ammonia, applied to the pustule when it first appears, then covering it immediately with collodion, almost a specific. This should be followed by the muriated tincture of iron. The following ointment has been used very successfully: Take sulphate of sanguinaria, one dram; adeps, one-half ounce; pulverized camphor,

two drams; form an ointment, and apply two or three times a day. When the blood is loaded with effete matter, and the patient of full habit, benefit will be derived by administering one or two drams of the compound syrup of stillingia every day.

Dr. Tanner recommends the following: Take liquoris arsenicalis, three drops; tinctura lupuli, thirty drops, infusi quassiæ, one fluid ounce. Mix; to be taken three times a day.

Lupus, (or Eating Tetter.)—Lupus occurs in a variety of forms, generally upon the face. It is an inflammatory affection, with more or less hypertrophy. It commences by slight thickening and elevation of the skin, usually not larger than a kernel of wheat, or half a pea. A thin, hard, brownish scab appears on its surface. The scab, if removed, shows a thickened, indolent, and elevated portion of the integument. The disease extends slowly, but gradually, until, in many cases, it produces extensive destruction of the integument, which is followed, in some instances, by prostration, general constitutional derangement, and death. Lupus has been divided into *lupus superficialis*, and *lupus devorans*, or *noli metangere*. The *noli me tangere* is the most active form of lupus, and is usually recognized as that form of cancer which appears about the face, neck, &c. It is most destructive in its character, destroying all the soft parts, and even the bones, in its progress.

Treatment.—Lupus, in all its forms, should be destroyed by the application of the caustic of potassæ; and healed by the mild zinc ointment. At the same time, the compound syrup of stillingia, iodide of ammonia, and chimaphilin, should be freely administered internally, for the purpose of purifying the fluids.

Frambœsia.—Frambœsia, pian, or yaws, from the French ramboise, a strawberry, is a cutaneous affection, characterized by an eruption of tubercles, or excrescences. It rarely occurs in Europe, but is common in Africa, portions of America, and the West Indies. The eruption is largest and most abundant about the face, scalp, axilla, and genital organs. It usually occurs without any precursory symptoms, and appears first as small, dusky-red spots, which gradually become converted into larger tubercles, isolated at their summits, but collected together at their bases, and often

resembling raspberries in their color, size, and shape. The tubercles are usually hard, covered with dry scales, and occasionally inflamed. If the inflammation spreads, ulceration soon sets in, a yellow sanious discharge resulting, which soon concretes into crusts around the tumors. The hair in the parts affected loses its color, and becomes white. They occasion no pain, except when they occur in the palms of the hand, and on the soles of the feet. In vigorous subjects, the color is reddish; while in the feeble and cachectic, it is sometimes whitish.

The complaint runs a certain course, varying in different individuals, from six to eight months, to one, two or three years. It is not a dangerous affection, although in enfeebled constitutions, ulceration of the fauces, falling of the nose, and caries of the bone may take place.

The only known cause of the disease is contagion. Children are most susceptible, and negroes more so than whites.

Treatment.—The constitutional treatment consists in iodide of ammonia, cod liver oil, quinine, and juglandin. The topical applications of emollient poultices, iodine ointment, iodide of lead; and in cases where the tumor cannot be removed, it may be destroyed either by caustic of potassa or by the arsenical paste.

Keloid.—Keloid, kelis, cheloidea, or cancroide, was first fully described by Alibert, under the above names, owing to the disease presenting a flattish, raised patch of integument, resembling the shell of a tortoise. It consists of small, flat, tender excrescences, or cuticular folds, raised a few lines above the level of the derma, having irregular forms, with slight depressions in their centres, and being covered with wrinkled epidermis. Sometimes the excrescence resembles a cicatrix, left by a burn, which, though soft, smooth, and shining upon the surface, is hard and resistant to the touch. There may be only one tumor, which is situated on the middle of the anterior part of the chest; but not unfrequently there are several, which are usually found on the neck, back, arms, thighs, and face. They are generally small, when numerous. Their growth is sometimes attended with heat, itching, pricking, and again with lancinating and burning pains; usually, however, no other uneasiness is experienced than a feeling of stiffness, or ten-

sion of the skin. The affection is slowly developed, rarely ending in ulceration, and seldom undergoing resolution. The tumors have, in some instances, disappeared spontaneously, leaving a cicatrix. It has no analogy with cancer. The cause is unknown.

Treatment.—Dr. Wood remarks that no treatment is found to produce benefit in this disease, excepting iodine. Dr. Tanner states that the only remedy is arsenic, while others have reported cases as cured by iodide of potassium, and cod liver oil.

Vitiligo.—The term vitiligo originated from a supposed resemblance of the part affected to the color of veal. It is a rare disease, and is characterized by smooth, white, shining tubercles, appearing about the ears, neck, and face, and sometimes over nearly the entire body, intermingled with shining papulæ. They vary much in their course and progress. In some instances, they attain the size of a large wart in a week, and then begin to subside, becoming level with the cuticle in about ten days. In other instances, they are smaller, more durable, advance less rapidly, and as they gradually become flattened to the level of the surface, they creep along in one direction, chequering the whole superficies with a veal-like appearance. The hairs are permanently lost on the part affected, which is left smooth and shining, with a morbid whiteness, continuing during life. The tubercles never ulcerate, and there is little constitutional disturbance. Drs. Thomas Addison and Wm. Gall describe two varieties, the *vitiligoidea plana*, and *tuberosa*, which may occur separately, or conjointly. In the former, the tubercles are flat, slightly elevated patches, with a moderate degree of hardness, and a yellow, opaque appearance. They usually appear on the eyelids, hands and wrists, and are disposed to be symmetrical on the opposite sides of the body. In the latter the tubercles vary in size, from a pin's head to that of a large pea. Their color is yellow, mottled with a rosy tint, and with minute capillary blood-vessels ramifying over them. In some of the cases which have been treated at Guy's Hospital, there appeared to be some connection between this affection and derangement of the liver.

Vitiligo is confused by some authors with lupus non-exedens. Erasmus Wilson considers it a mere synonyme of this variety of lu-

pus. Other writers have confused it with lepra alphoides. Alibert applied it to a simple loss of color, without alteration of texture, constituting a partial albinism.

The *cause* of the disease is not yet ascertained. It occurs generally in middle-aged persons. It occasions considerable mental distress, especially when occurring in the young, yet it may, by untiring care, be removed.

Treatment.—The indications of treatment are to enrich the blood with tonics, iron, cod liver oil, nutritious diet, out-door exercise, and bathing.

ORDER VI.—PUSTULÆ.

Impetigo, (*Crusted Tetter.*)—Impetigo is a cutaneous affection characterized by numerous pustules occurring separately, but which soon become confluent, secreting a lightish-yellow pus, which breaks, and forms a greenish-yellow crust. The pus usually continues to be secreted, and, drying, adds materially to the dimensions of the scab. In time the scab is forced off by the accumulation of pus, which forms beneath, but is soon reproduced in the same way as the previous one. The disease frequently spreads by means of fresh crops of pustules, until large portions of the body become involved. Three divisions of impetigo have been made, viz., *figurata*, *sparsa*, and *capitis*, (see plate, skin disease, div. 3d, fig. 18.) Impetigo figurata is so named from the pustules appearing in a circular or ovoid shape; while impetigo sparsa, as its name indicates, occurs in distinct pustules. Impetigo capitis is confined to the scalp, and is the only disease of an eruptive character which usually appears on the head, it being mostly confined to children.

Causes.—It is supposed that the disease results from a scrofulous tendency of the system. Mr. Neligan states that it is produced by irritants applied to the skin, especially to the scalp. It also appears in some cases about the age of puberty, and is supposed to proceed from imperfect menstruation.

Diagnosis.—Impetigo is always characterized by the appearance of small, semi-transparent pustules. The only diseases with which it is liable to be confounded, are eczema and ecthyma, from which it may be distinguished by the pustules in impetigo being larger. The scab forms are thicker, and the quantity of pus secreted is much greater than in eczema or ecthyma.

Sycosis has, in a few instances, been confounded with impetigo; but as sycosis is always confined to the face, which is covered with a beard, and is not of a true pustular character, it need not be.

Treatment.—In the treatment of acute impetigo of strong and robust children, the bowels should be opened by means of small doses of podophyllin and cream of tartar. A hot bath should be given; and if there be fever, small doses of the tincture of veratrum viride given to control it. As a local application, take equal parts of pulverized sanguinaria canadensis, or blood-root, and nymphæ odorata, one ounce; good cider vinegar, six ounces; mix, and let it tincture twenty-four hours, and apply as a wash with a sponge four or five times a day. In cases where there is a scrofulous or tuberculous tendency, and the disease is of a chronic character, the following compound will be found valuable:—Take ferri hypophosphite, one dram; juglandin, ten grains; quinine, twelve grains. Mix. Make sixteen powders. Dose, one taken three or four times a day, in a spoonful of cod liver oil. Also apply the following ointment:—Take glycerine, two ounces; baptisin, ten grains; creasote, ten drops. Mix, and apply with a camel's hair brush four or five times a day. The parts should be thoroughly washed with warm water and soap between each application of the ointment. After the powders have been taken, the following mixture may be given:—Take essential tincture of cinchona, one ounce; essential tincture of baptisia tinctora, one dram; pyro-phosphate ferri, one dram; syrupus simplex, four ounces. Mix. Dose, one teaspoonful every three or four hours during the day.

When the disease proves obstinate, and especially if confined to the scalp, the head should be shaved; and, in addition to the other treatment, bathe in a solution of sulphate of zinc, of the strength of one dram to four ounces of water. Dr. Bennett recommends in these cases the tar ointment. When the lymphatics are implicated, I have obtained benefit from the chimaphilin given in one or two grain doses, in combination with iron, three or four times a day. The diet and habit of the patient should be well regulated.

Ecthyma, (*or Papulous Scale.*)—Ecthyma is an eruption of phlyzacious pustules on a hardened, inflamed base, commonly found alone, but sometimes in small groups, terminating in scabs of a yel-

lowish-brown color. It is rarely met with in children, but frequently occurs in adults. The pustules appear chiefly on the extremities, although they may affect any portion of the skin. There are two divisions of ecthyma, viz., Ecthyma Acutum, and Ecthyma Chronicum. The eruption of acute ecthyma is preceded by a slight fever; in about thirty-six hours, small, red spots appear on the skin, accompanied by heat and tingling. On the second day the centres of these spots are raised by the pus contained in them, which form the *phlyzacious pustule* of the disease. This stage of the disease is accompanied by much pain. Maturation occurs from the fourth to the sixth day. The disease terminates usually in about two weeks, although it may continue for five or six.

Chronic ecthyma is a common eruptive disease, occurring more frequently than the acute form, and in weakened constitutions at every age, but more commonly in very young children. The eruption is the same as in the acute form, except that there are no preceding symptoms. The chronic character of the disease is due to the constant succession of the pustules. The appearance of the skin is unhealthy, being covered with large spots and stains. The constitution, especially in old persons, becomes very much weakened. This form of the disease may last five or six months, or even longer, being connected with other affections.

The causes of ecthyma are topical and constitutional. Residing in damp places, wearing insufficient clothing, inattention to cleanliness, all aid in developing the disease.

Diagnosis.—Ecthyma is known by the phlyzacious pustules, and their detached manner of development. The small pustules somewhat resemble those of small-pox; but the manner of eruption, and its mode of appearance on different parts of the body, are sufficient marks of distinction. The pustules of ecthyma may also be confounded with those of syphilis in the second form, but the latter seldom occurs except in persons of advanced age.

Prognosis.—Ecthyma is not a fatal disease, except in its complicated form. The chronic form is of long duration, which injures the general health.

Treatment.—In acute ecthyma the stomach should be cleansed by a mild emetic, and the bowels opened by a gentle purge; after which the patient should take a warm bath, and aconite, to control

the fever. The inflamed and pustulated surface should be covered with a warm slippery elm poultice, kept constantly moistened with the tincture of lobelia. After the acute inflammation has subsided, quinine and iron should be given, followed by small doses of juglandin and chimaphilin; and, instead of the poultice, the following ointment applied:—Take oxide of zinc, one dram; sulphate of sanguinarina, ten grains; adeps, one dram. Mix, and form an ointment. Let it be applied four or five times a day. Wash th part thoroughly previously to each application. In the chronic form, the indications of treatment are to enrich the blood, regulate the habits of the patient, and by means of local astringents and stimulants restore the affected surface to its normal condition. This can be accomplished by giving hydrastin, alnuin, rumin, chimaphilin, iron, and quinine. The following is a valuable preparation:—Take rumin, one dram; pyro-phosphite ferri, half a dram; syrupus simplex, six ounces. Mix, and triturate. Dose, one teaspoonful four or five times a day. The following ointment is also valuable:—Take myricin, ten grains; baptisin, twenty grains; glycerine, one ounce; creasote, ten drops. Mix. Apply as an ointment. In case the disease should prove obstinate, the part may be washed once or twice a day in a solution of sulphate of zinc, and the patient should be placed upon juglandin and quinine for two or three days. The diet should be nutritious, and the patient should be prescribed to take out-door-exercise and frequent baths.

ORDER VII. PARASITICI.

Under this order are included cutaneous affections which depend upon a parasitic growth, belonging either to the vegetable or animal kingdom. The animalcular parasitic affections which we will consider are scabies, and entozoon folliculorum; while the cryptogamous are tinea tonsurans, tinea decalvans, tinea sycosis, and tinea versicolor, or chloasma.

Itch or Scabies: This disease is caused by minute white insects, the *Acarus Scabiei*, or Sareoptis hominis, which insinuate themselves beneath the cuticle, and travel over the different portions of the rete mucosum. It is said that these insects travel in pairs, male and female, and that the female is very much smaller. By

the aid of the microscope, they are observed to have a large number of bristles upon the head or proboscis. When they find a soft and moist portion of skin, they burrow beneath a small dermoid scale, and luxuriate until a deposition of a small quantity of serum from the blood warns them that unless they take their departure, a flood will soon overtake them. But before taking their final leave, the female deposits her eggs at the point of the vesicle; thus a nidus is formed for the complete development of the *acarii.*

Symptoms.—A vesicular eruption makes its appearance between the fingers, and in other soft portions of the skin, accompanied by an intolerable itching. If the vesicle be opened, a small amount of sero-albuminous matter will escape, and if allowed to dry, will form a light brown scale. The cause of scabies is contagion.

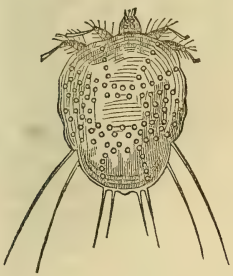


Fig. 36.

Fig. 37.

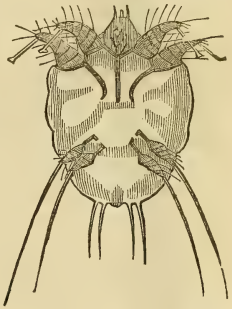


Fig. 38.

Treatment.—The only remedy necessary in the treatment of this disease is sulphur, and the reason why this remedy is not more successful, is the inefficiency of its application. The entire surface of the patient should first be washed with soap and water; immediately afterwards, a strong decoction of sulphur should be applied to every portion of the body, and allowed to remain from one-half hour to an hour, when the whole surface should be wiped with a towel, wrung out of strong saleratus water. One application of the sulphur, used as directed above, will generally remove the dis-

Fig. 36, Dorsal Surface of female Acarus Scabiei. Fig. 37, side view of the same. Fig. 38, Abdominal view of the male Acaries magnified 100 diameters.

ease; yet it is advisable to renew the application several times. The sulphur, on coming in contact with the insect, immediately destroys it. Ioduret of potassium and of sulphur, and the alcoholic extract of staphisagria, when properly applied, will also destroy these parasites.

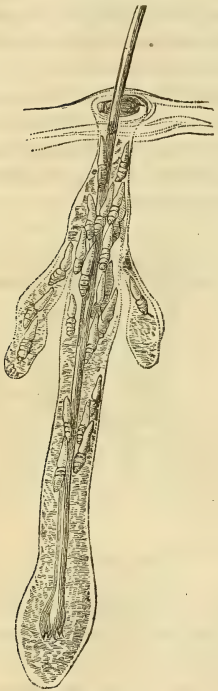


Fig. 39.

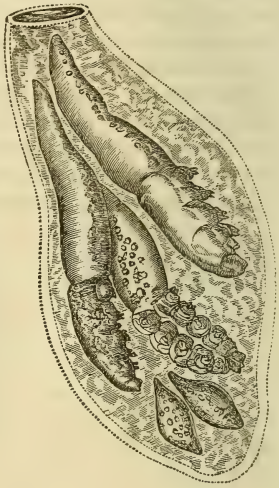


Fig. 40.

Entozoon Folliculorum.—Entozoon inhabits the sebaceous follicles of the skin and hair, and is very common in the face, more especially when the seat of acne or small pimples. (See figs. 39 and 40.) In the follicles of the nose, they are present in the ma-

Fig. 39.—Hair and its follicle, in which may be seen the animalcules descending towards the roots of the hair and cul-de-sac of the follicles, magnified 100 diameters.

Fig. 40.—Cul-de sac of a sebaceous follicle in different positions, and two eggs, magnified 350 diameters.

jority of living persons, and, according to Simon, are almost universal in dead bodies. He frequently found them living six days after the death of the individual in whom they were found. The animal measures from 1-135th of an inch, to 1-64th of an inch in length, and from 1-155th of an inch, to 1-555th of an inch in breadth. It is composed of a head, a thorax, and an abdomen.

The *head* represents, in form, a truncated cone, flattened from above downwards, and directed obliquely downwards, from the interior part of the trunk. The existence of an eye, has not been determined. The head is furnished with two maxillary palpi, which admit of extensive motion. The thorax is the broadest part of the animal, and is composed of four segments. In each of these, on each side, are two legs, eight in all. The abdomen varies in length, is annulated in structure, and admits of certain movements. Internally, Dr. Erasmus Wilson has traced out an alimentary canal, and its termination in an anus, together with a brownish mass, which he considers to be the liver. No sexual differences have been discovered in them, and they possess no respiratory organs.

The animal is easily found by compressing with two fingers the skin we wish to examine, until the sebaceous matter is squeezed out in the form of a little worm. This matter should be placed in a little drop of oil, previously heated, then separated with needles, and examined with a microscope, magnifying two hundred and fifty diameters. Their movements are slow, while the conformation of their articulations only permits them to move forwards and backwards, like lobsters.—(*Gruby.*) They are nourished by the sebaceous secretions of the follicles.

They most commonly occupy the excretory ducts of the follicles, which are often dilated in the places where they are lodged. Their head is always directed towards the base of the gland. When there are many together, they are placed back to back, and their feet are applied against the walls of the duct. When very numerous, they are compressed closely together, and are found deeper in the ducts. They rarely exist, however, at the base of the gland. In young persons they vary in number, from two to four. In an aged individual, they may be from ten to twenty. Though this entozoon may occasionally be associated with acne, it seldom gives rise to great inconvenience. According to Erasmus Wilson, the difficulty seems

to be not to find these creatures, but to find an individual, with the exception of newly-born children, in whom they do not exist.

Treatment.—Apply to the parts, a weak solution of aqua ammonia or corrosive sublimate, and press the entozoon from the follicles.

TINEA TONSURANS.—This contagious parasitical affection is characterized by the decolorization and brittleness of the affected hairs, the scaly eruption, and the roundness of the diseased patches. The parasite is the *tricophyton tonsurans*, the sporules and mycelium of which infiltrate the texture of each hair, while they also spread among the epithelial scales. Bateman and Willan call this disease *porrigo scutulata*, or *scald head;* Hebra, *herpes tonsurans;* Erichsen, *herpes circinatus*, and Erasmus Wilson, *trichosis furfuracea.* Vulgarly, it is styled ringworm. It occurs on the scalp in children, but on young adults it attacks the general surface. When occurring upon the head, there is usually, at first, an erythematous, or else a vesicular eruption, attended with itching. The hair breaks off almost close to the scalp, so that one or more circular patches are seen, generally covered with minute furfuraceous scales. The hairs around the part appear dry and dirty. The hair follicles seldom become obliterated.

Treatment.—The treatment consists in thoroughly washing the part in castile soap, succeeded by the following solutions:—Take lac sulphur, one ounce; acetate of lead, half ounce; rose water, four ounces; apply thoroughly after each washing. Ten grains of oxalic acid dissolved in six ounces of water, and applied by means of a camel's hair brush, will also destroy these parasites. Bathing the head in the acetic tincture of podophyllum peltatum, followed by a cold shower bath, has been successful in many cases.

TINEA DECALVANS.—This affection consists of patches of baldness, more or less circular, or oval. The portion of the scalp affected is smooth, shining, remarkably white, and quite hairless, while all around it the hair is perfect. It seldom leads to permanent baldness. It is not as contagious as the other varieties of tinea. In rare cases it spreads and destroys every hair upon the body, thus inducing considerable deformity. The fungus is the *microsporon audouini*, the sporules of which form a sort of sheath about the hair, and at last penetrate into the neighboring epidermis.

Treatment.—Bathing the head with a solution of equal parts of sugar lead and of sulphur, followed by brisk friction and bathing, has proved successful. Equal parts of Mecca oil and cod liver oil, applied by means of a stiff brush twice or three times a day, with an occasional shampooing, has been beneficially employed.

Tinea Favosa.—This parasitic disease is frequently observed. It most commonly affects the scalp, in which case it is designated as *porrigo*, or *scald head.* It appears in the form of small, elevated, dry, yellow crusts, about the size of a pin's head, each crust containing a hair in its centre, and somewhat resembling a piece of honeycomb (favus, or honeycomb.) There is itching; the hairs become brittle and finally fall out, the crusts have a mouldy, offensive odor, and are often surrounded with pediculi. The eruption gradually spreads, until, in some instances, the entire scalp is involved in the difficulty. It is usually confined to children, and is due to dirt and neglect in cleaning and combing the hair. In cases of long standing, the disease may extend to the face, neck, limbs, etc., inoculation with the sporules having occurred. It may, by destroying the hair-follicles, produce permanent baldness. The synonyms for this disease are *porrigo favosa, favus dispersus, porrigo lupinosa, porrigo scutulata, and favus confertus.* The parasite producing it is the *achorion schönleinii.*

Treatment.—The hair should be shaved close to the scalp, and the head must be thoroughly washed with soap and water, after which the zinc and tar ointment alternately applied, morning and evening—the zinc in the morning and the tar in the evening. The patient should likewise take a full dose of the alterative syrup three times a day. This course, if persisted in, will remove the disease. When the eruption appears on other parts of the body, the nitro-muriatic acid should be first applied, and be followed by the tar ointment. A mild purgative of juglandin and cream of tartar, also simple syrup of stillingia and scrophularia, equal parts, should be taken in small quantities during the application of the external remedies. When the pustular eruption is connected with extensive inflammation of the skin, a slippery elm poultice should follow the application of the ointment. Should the disease prove obstinate,

equal parts of vegetable caustic and pulverized sanguinaria, should be sprinkled over the parts before each application of the ointment. If there are constitutional symptoms, they should be treated according to their nature; in most cases, iron and vegetable tonics will be required. The diet should be nutritious, and the surface freely bathed once or twice a day. To remove the small pustules which appear on the face, apply a liniment made of equal parts of ammonia and sweet oil. Or, when they first appear, touch them with ammonia, and cover them with collodion. The celandine ointment may be used instead of the tar and zinc, and has proved of equal virtue.

Tinea Sycosis.—Tinea sycosis is an affection which is confined to the face, especially to that portion covered with beard. It is characterized by inflammation of the hair follicles, causing eruptions of small, acuminated pustules, which have been supposed to have a granulated appearance, resembling the substance of a fig. It is supposed to depend upon the presence of the parasite *microscopum mentagrophytes*. In some instances, it is aggravated by the excessive use of alcoholic liquors. Willan and Bateman term this affection *mentagra*, and Cazenave, *sycosis*.

Treatment.—The treatment consists in shaving the beard closely, and painting the part with a strong tincture of iodine for two or three days. This should be followed by a poultice, composed of equal parts of pulverized lobelia seed, sanguinaria canadensis, gum myrrh, and slippery elm. It should be changed every two or three hours, and continued for three or four days; and if the first application of the iodine and poultice does not cure the disease, the former should be reapplied for three or four days, and again followed by the latter. In some cases, I have followed this treatment by an ointment of iodide of lead. But little constitutional treatment is required, save keeping the bowels open by mild laxatives.

Tinea Versicolor.—Tinea versicolor, commonly known as chloasma, appears in the form of small, grayish or dull reddish spots, which soon increase in size, and assume a yellowish, brownish-yellow, or tawny color. They are usually seated on the anterior part of the neck and chest, abdomen, back, or the inner surface of

the thighs. Its duration varies from a few days to many months or years,—no other inconvenience attending the affection than a moderate itching, which is increased by whatever excites the surface, as the warmth of the bed, and the use of stimulating food and drink. According to Eichstedt, its existence is produced by the presence of a cryptogamic plant—the *microsporon furfur*. Want of due personal cleanliness favors the growth of the fungus. Occasionally, however, the affection has been ascribed to exposure to the sun, irritating articles of food, the abuse of spices and alcoholic drinks, menstrual derangements, and the suppression of hemorrhoidal discharges.

Treatment.—It can be cured by thorough baths, followed by a weak solution of the muriated tincture of iron.

ORDER VIII.—MACULÆ.

Ephelis.—This affection, which is an increased hue of the pigment of the skin, is divided into three varieties, *ephelis lenticularis*, ephelis hepatica, and ephelis violacea. Ephelis lenticularis, or freckles, appears in small, yellowish, brownish, or greenish-yellow, irregular, roundish spots, caused particularly by the influence of the sun's rays upon the parts. It occurs generally in females, owing to their fine skin.

Ephelis hepatica appears mostly in patches, of a dark-yellowish hue. They occasion an itching, which increases on rubbing the part. It is observed most frequently in females, especially during utero-gestation. It may continue for many months, although it usually disappears in a very short time.

Ephelis violacea is caused by the long use of nitrate of silver, which changes the color of the cutaneous surface to a grayish, or leaden hue, and is considered a permanent disease.

Treatment.—Freckles may be removed by keeping out of the sun-light, and frequently washing the face in a solution of lactic acid, of the strength of one dram to two ounces of water. Fresh buttermilk will answer the same purpose. Maculæ arising from the deposit of pigmentary matter in the cuticle, caused by a derangement of the uterine functions, can only be removed by uterine tonics, iron, baths, and a generous diet. In the use of nitrate of silver, much care should be taken not to expose the patient to a

strong light, otherwise a permanent discoloration of the skin may ensue.

Pigmentary Nœvus.—Pigmentary nævus, or mother's mark, is characterized by discolorization, more or less elevation of different parts of the body, easily engorged, and composed of loose, cellular structure. It usually exists at birth, and seldom changes during life.

Treatment.—If but a small portion of the integument be affected, and so located as to disfigure the patient, it should be removed; otherwise it should not be interfered with. The best method for removing it consists in inserting through it a large number of small steel needles, and so encircling them with the ligature as to interrupt the circulation; allowing these to remain until the parts slough off. The sore will heal by granulation, and usually present a healthy appearance.

Albinism—Albinismus—Leucopathia.—This affection consists of a diminution, or total absence of the coloring matter of the skin. Persons extensively affected, are termed albinoes. It is found among all races, but is the most striking in the black. Not only is the skin of a uniform, dull, milky-white appearance, but the hair loses its color, resembling bleached flax or silk, the iris, retina, and choroid, are red, which are thus rendered extremely sensitive to light, so that the individual can see better in the dark. It is usually congenital, but sometimes is accidental, in which case it is apt to be partial, giving the surface a piebald appearance.

DISEASES OF THE HAIR.

Having considered those affections due to the presence of a parasitic fungus, we will now describe those arising from general causes. The hair, like other structures, is affected by the health of the wearer. *Loss of hair, baldness, or alopecia*, may be partial or general, temporary or permanent, and occur at any period of life. It is more commonly observed in males than females. Congenital absence of hair has sometimes occurred, resulting from some imperfect development of the apparatus which secretes this appendage. Senile *calvities* usually takes place gradually, the hair first becom-

ing thin on the crown, or on the temples and forehead. The baldness which occurs from debility, hemorrhages, fevers, phthisis, syphilis, etc., is owing to the general loss of power of the nutritive functions of the hair, and the follicular apparatus. *Hirsuties*, or an augmented growth of hair, is sometimes observed in association with constitutional debility. In strumous and phthisical patients, the hair of the head is occasionally very long, and the eyelashes thick. Hair may also be observed on the surface of the mucous membrane of the mouth, intestinal canal, bladder, vagina, etc. It is also frequently developed on the chin and upper lip, in women advanced in life, especially those who have never borne children. *Moles, mother's marks, or nævi pilosi*, consist of dark-colored patches, covered with hair. They are formed by irregular deposits of pigment, with enlargement of the hair follicles and bulbs; the capillary vessels being normal, instead of increased in number and size, as in vascular nævi. Pilous nævi are often about the size of sixpence, but occasionally they are seen of much greater magnitude. Alberti mentions a case, in which the skin of nearly the whole body was studded with black moles, covered with dark and thick woolly hair.

Canities, *or a loss of the color of the hair*, may depend upon advanced age, disease, or deep mental emotion. In a few instances, partial canities is congenital. In the Albino, the whole of the hair is deprived of pigment. In senile canities, the grayness occurs gradually, after the age of forty. Cases are recorded in which the loss of color was complete in eight days, while in others the hair was almost entirely blanched in a single night.

In some instances *the hair may grow in a wrong direction, trichiasis.* Thus the points of five or six eyelashes, especially the upper, may project to the surface of the eyeball, giving rise to great annoyance and irritation. In *distichiasis*, the tarsus has a supernumerary row of cilia, the points of which irritate the eye as in the former.

Plica Polonica, *or Trichonosis Plica* is an endemic disease of Poland, and some portions of Turkey and Russia. It is characterized by tenderness and inflammation of the scalp; the hairs become

swollen and imperfectly formed, while the hair-follicles secrete a large quantity of viscid, reddish-colored fluid, which agglutinates the hairs, and unites them into tufts or felt-like masses. Tricophyton tonsurans, and tricophyton sporuloides have been detected upon microscopical examination, when the disease is of long continuance. Occasionally, the matted hairs are loaded with pediculi. It may involve the hairs on any part of the integument. The odor is most disgusting.

Treatment.—Various remedies have been suggested for baldness. Those which have been of the most benefit are lac sulphur, sugar of lead, equal parts, dissolved in water, so as to form a moderately strong solution, to which add about one half the quantity of the tincture of cantharides. This should be applied by means of a stiff brush, three or four times a day. The digestion should be improved by means of tonics, baths, etc.

Excessive growths of hair may be prevented by applications of nitro-muriatic acid in solution. Shampooing, Mecca oil, and cantharides and glycerine in the form of an ointment have been successfully used for baldness. Plica Polonica should be treated as eczema capitis.

DISEASES OF THE NAILS.

The nails may be described as horny laminæ, originating in a fold of the cutis vera, and so placed as to protect the extremities of the fingers and toes. There may be a congenital absence of one or more of them, or a nail may be developed in an unusual situation. Curving of the nails, and clubbing of the last phalanges, have sometimes been observed in cyanosis, phthisis, etc.

Onyxis, or *ingrowing* of *the nail*, frequently occurs on the outer part of the great toes, in which the side of the nail is pressed into the flesh at its margin. The pressure and irritation being increased by walking, inflammation and ulceration may soon ensue. The ulcer becomes covered with flabby and sensitive granulation, and there is an unhealthy discharge. *Onychia, or disease* of the matrix, consists of a tedious ulceration about the root of the nail, arising from a depraved condition of the system, or a mechanical injury. There is pain and swelling at the root, and about the surrounding integument, a sanious discharge exudes at the sides, upon pressure, the

nail is raised, turned upward, and finally detached, exposing a foul ulcer, which may become glazed and irritable, and extend in all directions. The distal phalanx, occasionally, are necrosed.

Hypertrophy of the nails is often observed in bed-ridden patients, owing to neglect. *Psoriasis of the nails* is occasionally met with, as the consequence of an old syphilitic taint. The nails first become discolored, thickened, and rough; then raised, assuming the appearance of a coarse scab; while, finally, they crack, crumble away, and separate at their roots, leaving an unhealthy fissure.

Treatment.—Onyxis may be prevented by keeping the nail properly trimmed, the centre more closely than the outer portion. When it becomes inverted, the centre may be scraped once or twice a day, and the shoe should be sufficiently large to prevent pressure. When ulceration or granulation occur about the nail, it should be destroyed by means of potassa fusa, or sulphate of zinc, followed by slippery elm poultices, or mild zinc ointment. When the nail cannot be remedied in this way, it should be slit open by means of a sharp-pointed bistoury in the centre, and the inverted portion extracted by means of a forceps.

Onychia can usually be cured, when it first commences, by pencilling the diseased portion a few times with nitrate of silver. If it has advanced to ulceration, lint should be saturated in two parts of Mecca oil, and one of tincture of iodine, and applied, which should be renewed two or three times a day. Emollient poultices, and cold packs, may also be used in case there is extensive inflammation.

WARTS, CORNS, AND HORNS.

Warts, vegetations, or verrucæ, consist of collections of hypertrophied cutaneous papillæ, covered with epithelium. They may occur singly or collectively. They are met with most frequently on the scalp and face, though they may form around the corona glandis, and on the frænum, either as the result of balanitis, gonorrhœa, or uncleanliness. They may also occur in females, from any irritating discharge, and are found in clusters about the perinæum, vaginal labia, etc. The warty growths which form upon the face in elderly people, those on the scrotum in chimney-sweeps, and those which rarely occur on old cicatrices, are forms of epithelial cancer. The secretion from syphilitic warts is probably contagious.

These vegetations must not be confounded with mucous tubercles, or *condylomata*, which are formed of raised patches of skin, having a red, moist, flattened, and irregular surface, being generally covered with a dirty-white secretion, and accompanied by other secondary symptoms.

Clavus, or corns, consist in excrescences confined mostly to the toes and the soles of the feet, resulting from wearing tight shoes. They occasionally form on the elbows and knees, or on the extremities of the fingers. When the callosity is seated on a deformed toe, the annoyance and suffering are frequently intense, the pain arising not so much from the pressure of the hardened epidermis, as from the prolongation of one or more of its fibres into the cutis vera. Soft corns are formed between the toes, and are kept in this condition by the warm exhalations from the sweat-glands of the adjoining tissues.

Bunions consist of an enlargement, thickening, and inflammation of the bursa mucosa at the side of the ball of the great toe. Occasionally the bursa suppurates, a fistulous opening being commonly left after the pus has evacuated.

Horns consist of condensed and dried layers of epithelium, with or without a core, composed of greatly hypertrophied papillæ. They are seldom observed in the human subject. As they increase in size, they become curved, or spiral, and may resemble in shape the horns of an animal.

Treatment.—When the wart is of a syphilitic character, it should be clipped off with the scissors, and cauterized with nitrate of silver. When of a non-specific character, they are usually removed by the application of the tincture of iodine, once or twice a day, for several days.

Corns may be cured by shaving them closely and applying nitro-muriacic acid, or the ointment of chromic acid. Bunions may be cured by bathing them frequently in the oil of erigeron. Horns may be removed by means of proper surgical manipulation.

PHTHIRIASIS.

Phthiriasis or lousiness, is that condition of the body in which pediculi develop themselves. The human body may be infested

with three varieties: Pediculus corporis, P. capitis, and the P. pubis. All are oviparous, the eggs being known as nits.

Treatment.—These can be usually removed by proper cleanliness, and when occurring about the scalp and pubes, by the application of mercurial ointment, once or twice a day, for a few days.

DRACONTIASIS.

This is a singular helminthic affection, produced in the human body by the presence of the Guinea-worm. Its seat is the subcutaneous areolar tissue, and especially that of the extremities. There is a feeling of irritation in the affected part, where a cord like a ridge can often be felt. There may also be fever, cephalalgia, nausea, colic, and debility. A kind of boil usually forms, in the centre of which a black point is visible; while on the pustule breaking, the head of the worm may protrude. If the latter be injured, a milky fluid is discharged, which will be observed, upon a microscopical examination, to be loaded with minute dracunculi.

Treatment.—The parts should be poulticed with flaxseed, and as soon as suppuration ensues, the parasite may be pressed out, or in the early stage of the disease, it can be destroyed by the application of pledgets of lint frequently saturated in hot turpentine.

TRICHINIASIS.

Trichiniæ are small nematodes, which were first described by Prof. Owen, in 1835. They consist, as observed in the human body, of spirally-coiled worms, in the interior of small, globular, oval cysts, which appear to the naked eye like minute specks. When viewed with a microscope, they present a well-marked digestive apparatus in their interior, and the presence of reproductive organs. Leuckart states, that in an ounce of cat's muscle, he detected one hundred and twenty-five thousand trichinia. The cysts contain the immature worm, which, when extracted and straightened out, is found to be one-thirtieth of an inch in length, and one-seven-hundredth of an inch in diameter. They are also said to exist independently of the cyst. The embryos penetrate into the interior of the separate muscular bundles, and, after fourteen days, become fully developed into trichina spiralis. The points inhabited by the parasites, are converted into globular cysts, by calcification of the sarcolemma.

Causes.—As found in the human body, they are supposed to be introduced by eating raw, or imperfectly cooked meats. This is especially the case after eating ham or pork. It is said that thorough cooking destroys the trichina, and thus prevents the disease. Prof. Dalton describes the trichina as found in a ham that had been eaten by a family where several had died from a peculiar disease, as most numerous. Upon a microscopical examination, he found the muscles completely saturated with them.

Symptoms.—In several cases of this disease, which came under my notice, the first symptoms were extensive gastric disturbance, with nausea, and a tendency to vomit; associated with rheumatic pains, stiffness of the muscles, irregular, irritable pulse, intermittent fever, which was violently aggravated in paroxysms, thirst, restlessness, nervous excitement, and wakefulness, the patients being entirely unable to sleep. There is, usually, œdema about the face, which sometimes extends to the limbs and other portions of the body. If the immigration of trichina is great, there may be extreme prostration, with paralysis and death, the violence of the symptoms depending altogether upon the extent of the cause. As the parasites reach their destination, and become encysted in the muscles, the symptoms are generally ameliorated, although there is much prostration, gastric disturbance, and nervous excitement.

Diagnosis.—Dr. Tanner advises the removing of a small piece of muscle, and making a microscopic examination, although, he thinks, the diagnosis should not be mistaken, if the symptoms appear immediately after eating trichinous flesh.

Treatment.—In the early stage, within the first two or three days, an active lobelia emetic should be given, followed by a full dose of oleum ricini, and oleum terebinthinæ. This should be done for the purpose of removing the trichina from the alimentary canal. At the same time, a thorough vapor alcoholic bath should be administered, and a sufficient quantity of aconite or veratrum, to lessen the febrile excitement. The cases that I have treated, after administering the above, I gave equal parts of castor oil and turpentine, every night, sufficient to maintain an active condition of the bowels, followed by quinine and iron during the day, and an opium pill to produce sleep. Gentle tonics will be required during convalescence. In severe cases, the emetic, purge, and vapor bath, should be repeated once or twice a day.

SECTION XI.

DISEASES OF THE NERVOUS SYSTEM.

INFLAMMATION OF THE BRAIN.

CEREBRAL MENINGITIS.

Cerebral meningitis consists of an inflammation of the arachnoid and pia mater. The exudation poured into these cavities, in the acute form, consists of liquor sanguinis, presenting an unusually molecular character, and associated with numerous loose molecules and granules. In the chronic form, the albuminous corpuscles are seen to be broken down, and the whole is reduced to an amorphus, granular mass, largely composed of fat.

Causes.—Meningitis may be produced by a fall, or blow, exposure to the sun, depressing cares, intense application to study, overeating, alcoholic liquors, venereal excesses, syphilis, rheumatism, etc.

Symptoms.—Meningitis is characterized by rigors, a hot and dry skin, a hard and frequent pulse, hurried respiration, depression of spirits, vertigo, intense headache, loss of appetite, constipation, and vomiting. The face is alternately flushed and pallid, the conjunctivæ injected, while the eyes are suffused, and have a wild, anxious expression. Vomiting is an important feature. Delirium sets in early, the patient being noisy, violent, and restless. These symptoms continue three or four days, after which the fever abates, the pulse flags, the tongue is brown and dry, the excitement diminishes, and the delirium is apt to pass into stupor or coma. In a few days there is extreme prostration, and the symptoms resemble those of the last stage of typhus. When the disease terminates favorably, the improvement is very gradual.

Inflammation of the dura mater is usually the result of violence, or of diseases of the bones of the skull. Chronic affections of the ear and nose, occurring in children, may sometimes terminate fatally by a rapid extension of the morbid action of the dura mater.

Anatomical Characters.—When the dura mater is the seat of inflammation, it is observed reddened, ulcerated, gangrenous, or covered with a layer of lymph and pus. If the pia mater, it will be reddened, and infiltrated with pus or serum, adhering with more or less firmness to the brain. When the arachnoid is chiefly affected, it exhibits signs of sanguineous congestion, becomes opaque, and thickened, and its surfaces may be covered with pus or lymph.

Treatment.—In the treatment of inflammation of the membranes of the brain, the first object should be to evacuate the stomach and bowels, by a lobelia emetic, podophyllin and an anti-bilious purge. At the same time a thorough spirit sweat should be given. As soon as this has been accomplished, from one to ten drops of the essential tincture of veratrum viride, should be given, every fifteen or twenty minutes, until the pulse is reduced to the natural standard. The head should be bathed in warm or cold water, according to the constitution of the patient. In violent cases, ice should be applied to the head, and jugs of hot water to the feet. When the disease is of a traumatic character, the injury should receive attention, and if associated with malarial affections, quinine and iron should be given. In violent cases, ligatures should be applied to the extremities until the blood is induced to return to its natural channel. The purge, emetic, and spirit sweat should be repeated in a day or two, in case the disease should not yield to the first. During convalescence, a very low diet should be maintained for a few days

CEREBRITIS.

Cerebritis consists in an inflammation of the cerebral substance. It is of rare occurrence when uncombined with meningitis. There is, at first, a constant and violent pain in the head, which is soon followed by vertigo, fainting, obtuseness of the mental functions, confusion of ideas, and loss of memory. There may be numbness of the extremities, perverted vision, and, in some cases, total blindness. The pulse and appetite are variable, the bowels constipated, the epigastrium tender, and the hearing abnormal. As softening of the cerebral substance takes place, there is rigidity of the mus-

cles and convulsive paroxysms, ending in paralysis, or coma. At the end of three or four days, there may be a copious effusion of serum, followed by all the symptoms of compression. The inflammation in some cases terminates in abscess.

Causes.—The causes are numerous, and are essentially the same as those of meningitis. It is more apt to result from local injuries than the latter affection. Solid bodies in the brain may produce it. It is generally, however, a symptomatic affection, depending upon some other difficulty.

Anatomical Characters.—The character of the change varies with the stage of the disease, at which death occurs, and its location. If it terminates fatally during the early stage, the diseased part presents a congested appearance; if in the second, more or less softening, with purulent infiltration is observed; and in the third, clear pus is generally found, if the disease involve the cortical substance, though white softening may be present, if the medullary substance be the seat.

Treatment.—When the disease is associated with fevers, the treatment is already considered. When caused by injuries, in the first stage it may be treated the same as that of meningitis, with which it is usually associated. In the second and third stages, benefit may be derived by shaving the scalp, and applying evaporating lotions, such as alcohol and water, ether and water, etc. Cypripedin, phosphorus, and iodide of ammonia, are the remedies best adapted to arrest pathological changes occurring in the cerebral mass.

ACUTE ENCEPHALITIS OR MENINGO-CEREBRITIS.

Is characterized by fever, nausea, vomiting, intense headache, frequent and irregular pulse, constipation, a look of oppression or sullenness, intolerance of light and sound, watchfulness, suffusion of the eyes, and confusion of thought, or even delirium. These symptoms are most marked when the meningitis predominates. In about twelve hours to two days, the second stage, or that of collapse, sets in, which is characterized by stupor, difficult and indistinct articulation, impaired vision and hearing, dilated pupils, strabismus, paralysis of the muscles of the eyelids, subsultus tendinum, a ghastly countenance, sordes form on the gums and teeth, the body is covered with

a cold, clammy perspiration, the sphincters relax, convulsions, paroxysms, paralysis, and profound coma occur, and death closes the scene. Occasionally, the first symptom that attracts attention is a convulsion. In all forms of this disease, there is great diversity in the symptoms. It may terminate fatally in a few days, or the patient may struggle on for two or three weeks.

Causes.—The causes are often difficult to detect. Plethoric patients, and such as have short necks, are said to be more liable to an attack than others. It may occur in the course of continued fevers, measles, or scarlatina; or it may be due to disease of the bones of the ear or of the nose, poisoned blood, intemperance, or suppressed evacuations, wounds, blows, injuries, or dysmenorrhea.

Diagnosis.—Encephalitis may be confounded with the delirium of fever, and delirium tremens. In phrenitis, the delirium is an early symptom, and is generally violent; the pulse is sharp, hard, and often irregular, and there is usually nausea; while in fever, it is an after-symptom. In delirium tremens, the busy delirium, the soft and compressible pulse, the trembling of the hands, the loquacity of the patient, and the ease with which he is generally temporarily roused to answer questions rationally, sufficiently distinguish it from encephalitis.

Anatomical Characters.—The anatomical characters revealed upon dissection, are more or less vascularity of the substance of the brain; exudation, either upon the convolutions, or collected in one or more abscesses; softening of the cerebral substance, and serous effusions beneath the pia mater, and into the ventricles. The dura mater is seldom involved, unless the inflammation be the result of violence. In such cases, there may be a deposition of false membranes between the bone and dura mater, or between the dura mater and arachnoid; or we may find thickening of all the membranes.

Chronic Encephalitis.—This disease may succeed the acute variety, or may come on independently as the primary disorder. Among the general symptoms, are stammering, a stiffness of the muscles, slight headache, anorexia, constipation, and irregularity of the pulse. As the disease slowly progresses, there is loss of memory, the external senses become impaired, paralysis occurs, and the general health is completely destroyed. It may run its course in a few months, or continue for years.

Treatment.—The treatment consists in the active stage of that already described, in connection with a low diet, hot mustard pediluvia, blisters to the back of the neck, cups or leeches to the temples, and an active condition of the bowels, maintained by podophyllin and cream of tartar, together with thorough and constant packing of the head in ice. Cold douches applied to the head, have also been highly recommended. After effusion has occurred, iodide of potassium, in two or three grain doses, administered every two or three hours, is a remedy of great value. Bleeding and mercurials have been strongly recommended in this disease, but the most extensive experience has demonstrated them to be more injurious than otherwise. During the stage of exhaustion, animal broths, wines, or brandy, may be used to support the strength of the patient.

SOFTENING, INDURATION, AND TUMORS OF THE BRAIN.

Acute ramollissement, or red softening of the brain, is one of the terminations of the inflammatory process, being due more freqently to the acute than the chronic form. The softening is generally partial, and varies in degree from the consistence which naturally belongs to the cerebral substance, to that of thin cream. When resulting from acute inflammation, the parts usually affected are the corpus callosum, septum lucidum, fornix, and the cerebral substance surrounding the ventricles. The softened portion, in such instances, is frequently infiltrated with pus; while occasionally the purulent matter is contained in a well-defined cavity, forming *abscess of the brain.* White softening, the opposite condition to the inflammatory, is a morbid process occurring in the aged, from an insufficient supply of blood, resulting from disease of the cerebral arteries, inducing probably fatty degeneration of the brain tissue. The optic thalami, corpora striata, and convolutions, are the regions then affected. The presence of thrombi in the circulation of the systemic blood, may, by impeding the transit of a due quantity of this fluid, lead to imperfect nutrition, and finally to ramollissement.

Symptoms.—The general symptoms of cerebral *softening* are more or less severe and constant pain in the head, attacks of vertigo, an impairment of the intellectual faculties, embarrassment in asking

questions, a lachrymose tendency, melancholy, drowsiness, particularly after eating; prickings and twitchings in the limbs, sometimes pain, or again numbness, and impaired vision and hearing. In the *inflammatory* form, the limbs are more frequently the seat of painful cramps, stiffness, and contractions; cephalalgia is more intense, and the general sensibility more acute. In the second stage of either form, there may be paralysis of a limb, or of one-half of the body; questions are answered slowly, the patient has great difficulty in making himself understood; and there is much general feebleness, with a weak and intermittent pulse. There may be nausea, constipation, difficult micturition, and labored respiration, which, toward the last, becomes stertorous; and a state of coma supervenes, which may pass off in a day or two, but only to return, and become more profound, until it terminates fatally. Softening occurs more frequently after the fiftieth year, although it may be observed at any period of life.

Partial inflammation of the brain, especially when it is chronic, sometimes produces *induration*, which is probably due to a great increase of the albumen. The indurated portion is generally small in extent, containing but little blood, and presents the appearance of wax, or of boiled white of egg.

Tumors in the brain, either fibrous or scrofulous, are frequently observed, which give rise to a diversity of symptoms. *Tuberculous deposits*, *syphilitic gummatous growths*, and *hydatids*, are also found, the indications of which are usually very obscure, varying with the situation of the product, its size, and the condition of the nervous tissue around it. The most common symptoms are nausea, cephalalgia, vertigo, mental depression, with confusion, partial paralysis, and epilepsy.

Treatment.—When the disease is produced by over-mental exertion, a country residence, physical labor, and an absence from study, together with general tonics, will frequently overcome the difficulty. When the result of tobacco, masturbation, the excessive use of alcoholic liquors, anxiety and cares, the cause should be removed, and rest, country air, light exercise, frequent baths, and a generous diet be prescribed. The remedies that have been found most beneficial, are cypripedin, phosphorus, iron, iodide of potassium, lupulin, iodide of ammonia, valerianate of ammonia, and cod liver

oil. These may be given either singly, or in such combinations as the case may indicate. The bowels should be kept open by mild laxatives, and the skin thoroughly active by baths.

TUBERCULAR MENINGITIS.

The characteristic pathological feature of this form of meningitis, is generally considered to be the deposit of either miliary granulations, or yellow tubercle, in connection with meningeal inflammation. By some writers, it has also been termed *granular meningitis*, owing to the connection of the meningeal inflammation with the semi-transparent grayish bodies, known as miliary granulations. Its situation is, in the majority of cases, at the base of the brain, in this respect differing from simple meningitis, in which the superior and lateral portions of the cerebral hemispheres are the parts affected. In tuberculous meningitis, lymph is observed beneath the arachnoid covering, the pons Varolii, optic commissures, cerebellum, etc., and notably in the fissure of Silvius. It may, however, extend to the convex surface of the cerebrum. Congestion of the vessels of the pia mater and cerebral substance, serous effusion into the ventricules beneath the arachnoid, flattening of the convolutions in proportion to the effusion, cerebelli ramollissement at different points, and minute extravasations have been observed. Semi-transparent granulations, with or without a yellow tuberculous deposit, are found in the lungs, and frequently in the spleen, liver, etc.

Symptoms.—The development of the meningitis may be preceded by the symptoms of pulmonary tuberculosis. Probably the latter always exists as an antecedent affection, after infancy and childhood. When, however, the meningeal inflammation does not distinctly supervene upon this disease, it is usually preceded by pallor, loss of weight, capricious appetite, peevishness, intolerance of light, and sound, and indisposition to exertion. The development of the meningeal inflammation is generally denoted by cephalalgia, particularly referred to the forehead. Convulsions are less likely to occur at the commencement, than in simple acute meningitis. More or less febrile excitement occurs. The skin is hot, the tongue

furred, the breath offensive; there is often nausea and vomiting; and the bowels are usually constipated. The cephalalgia is frequently severe; lancinating pains occur, causing infants to give a sudden, sharp, and short cry, known as the *cephalic* cry. Raising the lids and exposing the eyes to the light, occasions crying in infants. The conjunctiva is frequently suffused. The hands are often carried to the head, and if the child is old enough to speak, it cries out frequently, "Oh! my head." The expression is often frowning, and the face may be flushed. The child is drowsy, yet restless, he sleeps badly, moans and grinds his teeth, screams and awakes suddenly without any apparent cause.

After the course of four or five days, the disease, if unchecked, passes into the second stage. There is now less suffering from headache, the pulse becomes irregular, and diminished in frequency, often falling in a few hours from 120 to 80, somnolency increases, the patient is with difficulty aroused, incoherency is common, and occasionally drowsiness alternates with paroxysms of delirium; the pupils are dilated, and the countenance is expressive of anxiety and suffering. Masticatory movements, rolling of the head, or boring the pillow, and grinding the teeth, are symptoms peculiar to infants. As the somnolency increases, the movements of the eyeballs are not uniform, strabismus frequently occurs, and oscillations of the balls are occasionally observed. The eyes are closed, and the eyebrows knit; however, in some instances, the lids are widely open. Vision is frequently lost. Subsultus, carphologia, fumbling with the bed clothes, convulsions, complete anorexia, vomiting, sordes of the lips and teeth, retraction of the abdomen, retention of urine, and partial paralysis, are frequent attendants.

The transition to the third stage, is marked by coma, more or less profound, from which it is impossible to rouse the child, followed by impairment and loss of deglutition, difficult respiration, a frequent and feeble pulse, cold extremities, and a cold, clammy perspiration, which finally terminates in death by apnœa and asthenia combined. The duration of the disease is usually two weeks, and its termination is almost invariably fatal.

M. Bouchat was the first to make use of the ophthalmoscope in

tubercular meningitis; and he asserts that in many cases the following characteristics may be observed before the convulsive period sets in:—Peripheral congestion of the papilla, with spots of congestion in the retina, and choroid, dilatation, varicosity, flexuosity, and thrombosis of the retinal veins around the papilla; and retinal hemorrhages from rupture of the veins.

Treatment.—The bowels should be opened freely with small doses of podophyllin and neutralizing mixture, and during the entire disease this medicine should occasionally be repeated. Cold or evaporating lotions should be applied to the head, and renewed frequently. The diet should consist of fresh milk, cream, rare cooked eggs, and animal broths. Immediately after the action of the purge, one dram of iodide of potassium may be added to four ounces of water, and one teaspoonful administered every two or three hours. At the same time, the following compound should be given to support the blood, and to reduce inflammatory excitement of the meninges of the brain:—Take ferri hypophosphite, one dram; calcis hypophosphite, one-half dram; sodium chloridii, two drams; oleum morrhuæ, one ounce; fluid extract chimaphila umbellata, two ounces; syrupus simplex, four ounces; tinctura aconite folia, one-half dram; mix, and let one teaspoonful be taken four or five times a day. After the iodide of potassium has been used for a week or two, it should be changed for iodide of ammonia. In cases of great cerebral disturbance, a few cups may be applied to the temples or nape of the neck. Dr. Hempel recommends belladonna to be given in very small doses, and in case there is febrile excitement, it should be controlled by aconite or veratrum.

HYPERTROPHY AND ATROPHY OF THE BRAIN.

True hypertrophy of the brain is a rare lesion, which occurs generally between the ages of twenty and thirty years. The skull, in some instances, increases in size as the brain becomes over-developed; and then there may be an absence of all symptoms, until, perhaps, death occurs in a sudden attack of convulsions. If, however, the skull is not enlarged, indications of compression ensue; and hence there will be mental derangement, varying from slight dulness of intellect to complete idiocy, paroxysms of headache, vertigo, anæsthesia of the motor powers, terminating frequently in

general paralysis; an unaltered or very slow pulse, and more or less severe epileptic spasms, from which death may result, or from a state of coma succeeding them.

The opposite condition, that of *atrophy*, affects usually the cerebrum, the cerebellum being rarely affected. It is incident to old age, and occurs in persons bed-ridden with various chronic diseases. It may result from an insufficient supply of blood from diseases of the vessels, and thus produced, may be limited to one hemisphere; or it may proceed from an arrest of development in fœtal life. Serous effusion, in proportion to the diminished volume of the brain, occurs within the sub-arachnoid space, or in the ventricles. In such instances, the liquid does not produce any serious effects from pressure. The disease is connected, especially, with anæsthesia of the mental powers, or imbecility; however, congenital hemiplegia may depend on atrophy of the hemisphere opposite to the paralyzed side. The *treatment* consists in attending to such constitutional symptoms as present themselves.

APOPLEXY.

Apoplexy is characterized by sudden insensibility, or loss of sensation, thought, and voluntary motion, together with more or less severe disturbance of the respiratory and circulatory functions, or, in other words, it is a state of coma occurring suddenly from pressure upon the brain at some point within the cranium.

The most frequent pathological condition is hemorrhage within the cranium. It may occur in the cerebral substance, or upon and between the meningeal membranes, or into one of the ventricles. All parts of the brain-substance are not equally liable to be the seat of hemorrhage. Those which are most liable are as follows:— The corpora striata, thalami optici, hemispheres, pons Variolii, crura of the brain, medulla oblongata, and cerebellum. An examination when death has occurred within a few hours after the extravasation, shows a clot with bloody serum contained in a cavity, produced by laceration of the cerebral substance. If some days have elapsed, there will probably be evidence of meningitis, as well as of softening of the convolutions. In the latter case, the blood may adhere to the arachnoid by a delicate transparent membrane. If extravasation has occurred into the substance of the brain, a

cavity is seen containing semi-coagulated blood and softened cerebral matter. At a later period, the coagulum will probably be much firmer, while the walls of the cavity have undergone some amount of inflammatory softening. If death has been prolonged for about twenty-five days, the coagulum may be small and isolated. Crystallized blood, or hæmatoid crystals, may be discovered upon microscopical examination.

Pathology.—An extravasation of blood has the same effect as compression by a depressed portion of the skull, owing to its being enclosed in an unyielding case. Under these circumstances, pressure on any part affects the circulation in the whole mass of brain, and, consequently, the apoplectic phenomena are due to the want of a proper supply of blood within the nervous mass. The immediate pathological condition, therefore, depends on the suddenness of extravasation, congestion, or the arrest of the circulation in a vessel of considerable size.

Causes.—Whatever tends to induce cerebral congestion, may produce apoplexy, as the habitual use of stimulating drinks, tobacco, opium, sedentary or indolent habits, great heat or cold, sudden excitement, mechanical violence, plethora from the sudden suppression of accustomed discharges, straining at stool, the throes of labor, sexual intercourse, and venereal excesses. Various organic affections, such as aneurism of the aorta, hypertrophy of the heart, ossification of the aorta, valvular heart disease, renal difficulties, the pressure of an overloaded stomach, bronchocele, etc., may increase the liability to apoplexy. Age constitutes a predisposing cause, as most cases occur after the age of fifty. Males are more subject to the affection than females.

Diagnosis.—The conditions with which it is likely to be confounded, are syncope, asphyxia, and, particularly, profound alcoholic intoxication. From syncope and asphyxia, it is distinguished by the almost imperceptible pulse and respiration in these two affections, while, in apoplexy, there is a full pulse, and, more or less, free respiration. Apoplexy may be distinguished from intoxication by the history of the case, the general appearance and age, the absence of the odor of spirits in the breath, the general relaxed condition of the muscles, and the more or less drawing of the mouth to one side. Besides, the pulse is slow, and the stertorous breathing well

marked; while, in intoxication, the stertor is either absent or feeble, and the pulse rapid.

Symptoms.—In the great majority of cases, an attack of apoplexy is without premonition. Cephalalgia, vertigo, a feeling of weight and fulness in the head, tinnitus aurium, temporary deafness, transient blindness, or sometimes double vision, epistaxis, fits of nausea, numbness in the limbs, great mental depression, loss of memory, incoherent talking, drowsiness, indistinctness of articulation, and partial paralysis, are among its previous warnings.

The apopletic seizure may occur in three ways. In the *first* form, the patient falls down suddenly, deprived of sense and motion, and appears as if in a deep sleep. The face is flushed, breathing stertorous, pulse full and frequent, and, in some cases, convulsions occur; in others, rigidity and contractions of the muscles of one or both limbs. In the *second* form, coma is not the first symptom, but a sudden attack of pain in the head occurs, followed by pallor of the countenance, nausea and fainting: sometimes there is vomiting, at others, syncope. Occasionally the pain is merely accompanied by slight and transient loss of consciousness, which, after the course of a few hours, is followed by heaviness and oppression of the brain, and forgetfulness, and the patient gradually sinks into perfect coma. In these cases, a large coagulum is usually observed in the brain. The *third* form commences by an abrupt attack of paralysis of one side of the body, sometimes with loss of speech, but no diminution of consciousness. The paralysis may pass gradually into apoplexy, or the loss of power may remain without more urgent symptoms; or it may slowly disappear, and the patient recover.

The duration of the attack varies from one or two hours, to as many days. There may be unconsciousness, with a hard, wiery pulse, slow, embarrassed, and frequently stertorous respiration, and frothy saliva about the mouth. In bad cases, the surface is covered with a cold, clammy perspiration, the face pale, eyes dull and ghastly, with pupils dilated, teeth firmly clenched, deglutition impeded or lost, respiration stertorous; bowels are either torpid, or else the stools are passed involuntarily, and involuntary micturition, or retention of urine occur, until the bladder becomes distended and overflowed, as it were, causing the patient to void urine constantly. Rigidity of the muscles, hemiplegia, and convulsive movements, occasionally occur.

The state of coma in apoplexy may cease in three different ways. It may gradually pass off, leaving the patient well, or it may terminate in incomplete recovery, leaving the mind impaired, and portions of the body paralyzed; or it may end in death. When it terminates fatally, leaving no traces of the disease, it is styled *simple* apoplexy; when there is extravasation of blood, *sanguineous* apoplexy, or cerebral hemorrhage; and when there is effusion of serum into the ventricles, or beneath the arachnoid, *serous* apoplexy.

Prognosis.—The prognosis of this disease is unfavorable in proportion to the prostration, stertorous breathing, and the difficulty of deglutition. If there is a complete suspension of the sensorial functions, great irregularity of the vital functions, difficult respiration, and an irregular intermittent pulse, the prognosis is unfavorable. During the first fortnight, there is danger of the hemorrhage recurring, or the clot acting as an irritant, producing inflammation in the nervous tissue. When the symptoms gradually diminish, they may terminate in more or less impairment of mind, and hemiplegia. A remarkable sequel in some instances, is the loss of speech, not from difficulty of articulation, but from an inability to use words. When this condition, *aphasia*, exists, the right side is usually paralyzed; hence it is inferred that lesions of the left hemisphere of the brain involve especially the liability to the loss of speech.

Treatment.—As soon as the premonitory symptoms of apoplexy manifest themselves, ligatures should be immediately applied to the thighs, and arms near the shoulders. They should be so adjusted as to prevent the return of venous blood to the trunk, thereby relieving the cerebral congestion. The ligatures have been found to exert all the beneficial influence claimed for venesection, at the same time retaining the blood in the system, so that after the disease is controlled, fatal exhaustion may not occur. As soon as they have been applied, a full dose of jalapin, podophyllin, and antibilious physic should be administered, so as to produce a thorough and quick evacuation from the bowels. In bad cases, this should be aided by a warm water enema, to which one or two ounces of the tincture of lobelia has been added. At the same time, bladders of ice should be applied to the head, and hot sinapisms to the feet,

thighs, and spine. As soon as the cathartic has operated, full doses of the tincture of veratrum, should be given, and the pulse maintained somewhat below its natural standard. The ligatures should be so adjusted as to maintain a slight venous congestion, during the entire treatment. When there are indications of effusion or extravasation, the above treatment should be followed by five or ten grains of iodide of potassium, two or three times a day. During the treatment, the diet should be very low, and all physical and mental excitement prohibited.

CONGESTION OF THE BRAIN.

Cephalæmia, or congestion of the brain, consists in an accumulation of blood in the vessels. It may be active, or passive; active when there is an undue determination of the blood; and passive, when it accumulates in a part, owing to some obstacle to its return by the veins. The former may be connected with simple hypertrophy of the left ventricle of the heart, and give rise to apoplexy, and sudden death. Its occurrence in this case may be determined by co-operating causes, which increase the action of the heart, such as exercise, or mental emotion, together with those which, at the same time, impede the return of blood to the heart, as over-distention of the stomach. Cases of this kind, however, are rarely observed, as simple hypertrophy of the heart in a marked degree, seldom occurs. Acute congestion is also produced by sun-stroke, excessive mental emotions, and alcoholic stimulants.

The *symptoms* are, a flushed countenance, suffusion or injection of the eyes, intolerance of light, and sometimes scintillations, heat, pain, and throbbing sensations in the head, vertigo, tinnitus aurium, momentary loss of consciousness, embarrassment in speech, and sometimes delirium. Transient hemiplegia is occasionally observed. The pathological condition is the same as that of the first stage of cerebral meningitis. Simple congestion is merely a functional affection, and in a slight, or moderate degree, involves no immediate danger. When developed rapidly, however, it may produce apoplexy, and sudden death, as already stated; and in a lesser degree of intensity, it proves serious, by giving rise to extravasation of blood, serous effusion, and perhaps inflammation. *Passive congestion* is characterized by accumulation of blood, with a sluggish circulation.

Causes.—It may be produced by any mechanical impediment to the return of blood from the head, as cardiac lesions, tumor of the neck, etc. Abolition of the sinuses by coagula, due to inflammation, and diminished arterial circulation, may induce it. When produced by the latter, it exists in various affections, in which head-symptoms become developed, in connection with feebleness of the circulation, and particularly in diseases of children accompanied with exhaustion, as cholera infantum. Its occurrence under these circumstances, especially in children, is owing to the less functional activity of the brain in early life, and the consequent less attraction for arterial blood.

Symptoms.—The symptoms are drowsiness, dulness of mind, blunted perceptions, and in children, sometimes convulsions. They are due to pressure of the distended veins, or the excess of venous blood, or the deficiency of arterial; and may lead to extravasation, or to serous effusion, as well as active congestion.

Treatment.—The treatment consists in diverting the blood from the head, by hot mustard pediluvia, and an active cathartic. As soon as the cathartic has operated, when the congestion is of an active character, cold applications should be made to the head, and sufficient tincture of veratrum viride administered to moderate the circulation. If the congestion be of a passive character, ten drops of the tincture of belladonna should be added to a tumbler of water, and one teaspoonful administered every half hour. When the congestion is accompanied with much pain in the head, and is caused by much congestion or over-engorgement of the stomach, an emetic should be administered previously to the purge; and if there be violent throbbing of the carotids, with an active, full circulation, the ligatures may be resorted to, as directed under the head of apoplexy. In persons predisposed to cerebral congestion, the cause or causes should be carefully investigated and obviated. The stomach should remain empty after it is evacuated, unless it be in cases where congestion is associated with great debility, in which event light broths may be administered. Leeching and cupping, and even blisters to the scalp and back of the neck, in connection with diaphoretics and opium, have been recommended by some authors.

CONCUSSION OF THE BRAIN.

Concussion of the brain is characterized by fainting, nausea, stupor, insensibility, or loss of all muscular power, succeeding immediately upon a blow, or some severe injury. The patient may rally quickly, or not for hours; or death may occur either at once, or after the lapse of a few days. Anatomical characters reveal laceration of some portion of the brain, or a general softening of its substance. When there is only slight concussion, or *stunning*, the person soon recovers consciousness, and complains merely of confusion of ideas, faintness, nausea, vertigo, tinnitus aurium, and a desire to sleep. When more severe, the insensibility continues longer; the patient lies as in a deep slumber, the pupils are insensible to light, the pulse is fluttering or feeble, the surface is pale and cold, the muscles flaccid, the sphincters relaxed, and the breathing scarcely perceptible. After a variable interval, partial recovery may ensue, which is marked by great confusion of thought, indistinct articulation, frequently severe vomiting, and sometimes paralysis of one or other of the extremities. In the worst forms, the individual is felled to the ground by the shock, and dies upon the spot. Occasionally the whole nervous system receives a shock by railway accidents, without any immediate indications of injury. But in the course of a few days, there may be a diminution in the power of motion, impaired sight, an attack of epilepsy, strabismus, or deafness, or tinnitus aurium, which may gradually pass off, or be the precursors of serous, cerebral, or spinal disease. The *prognosis* must always be guarded. In severe concussions, there is danger, first, from the depression, and afterwards, from excessive reaction. If, however, these difficulties be overcome, the convalescence is usually tedious, and frequently permanent impairment of memory, and anæsthesia of the nerves of special sense remain.

Treatment.—The treatment consists in chafing the temples, dashing cold water upon the face, the application of volatile stimulants to the nostrils, and stimulating enemata, to produce reaction, and the application of friction to the spine, together with hot mustard pediluvia, and hot baths, to equalize the circulation. These should be followed by small doses of belladonna, aconite, or veratrum, to relieve the cerebral confusion. The bowels should be opened with

a moderately active purge, and maintained in a soluble condition by a dram of sulphate of magnesia, taken at bedtime. A bottle of citrate of magnesia will answer the same purpose. If the concussion should be followed by cerebral congestion or inflammation, the treatment has already been prescribed under that head.

COUP DE SOLEIL.

The terms coup de soleil, sun-stroke, and insolation, are applied to affections occasioned, not exclusively by exposure to the sun's rays, as the words signify, but by the action of great heat combined generally with other causes. In a certain proportion of these cases, the morbid condition is expressed by the term exhaustion, in which the vital powers are prostrated, resulting in death by syncope. In others, it is essentially congestion, or apoplectic effusion into the cranium; but it is more frequently a combination of apoplexy and exhaustion. In its most perfect form it is met only in the tropics. Atmospheric influences other than heat are involved in its causation, as dryness and rarefaction of the air, and an unusual accumulation of electricity. Anatomical characters reveal congestion of the vessels of the pia mater, sometimes engorgement of the lungs, and congestion of the kidneys. The brain itself is usually healthy.

Symptoms.—The premonitions of the attack are slight or wanting. The symptoms generally experienced are faintness, thirst, great heat and dryness of the skin, pain in the head, vertigo, a sense of fulness and oppression in the epigastrium, occasionally nausea and vomiting, prostration, dimness of vision, a quick and full pulse, a hot skin, difficult breathing, contraction of pupils, congestion of conjunctiva, pallor of the face, intermittent action of the heart, involuntary evacuations, insensibility, and frequently convulsions. It sometimes occurs very insidiously. A man may be dull and listless, complaining of uneasy feeling, only in the head, which frequently proves fatal in a few hours. In some cases, after exposure to the sun, persons have immediately become insensible, and die after making one or two gasps. When recovery takes place, convalescence may be retarded by deranged secretions, continued fever, pulmonary difficulties, partial paralysis, and great prostration. Exclusive of mild cases, in which there is a transient stupor or insensibility, the danger in insolation is always great.

The mortality is estimated to range from forty to fifty per cent. If with deep coma, there is stertorous breathing, sighing, or moaning, the prognosis is extremely unfavorable. A frequent and feeble pulse, tracheal râles, relaxation of the sphincters, complete immobility, and convulsions are fatal prognostics.

Treatment.—The treatment consists of the preventive and curative. It can usually be prevented by keeping the body cool by sponging with tepid water, and the constant application of cold to the head. When exposed to the sun's rays, a handkerchief should be frequently wet and put in the hat, and worn on the head. Alcoholic stimulants, ice-water, and large draughts of water, should be avoided. As soon as the patient is seized with the disease, ice should be applied to the spine, ammonia to the nose, and an active stimulant administered. If the patient can swallow, two or three drams of brandy and fifteen or twenty drops of the tincture of capsicum should be taken every fifteen or twenty minutes, until reaction occurs. If deglutition be difficult, five or ten grains of capsicum, and one ounce of the tincture of xanthoxylin, or prickly ash berries, may be added to four ounces of starch water, and used as an enema. If this should fail to produce immediate reaction, the following liniment should be used:—Take oil of capsicum, one dram; oil of stillingia, two drams; alcohol, eight ounces; mix, and let it be applied over the entire surface with active friction. Pouring cold water upon the head from a considerable distance for some length of time is also valuable. The administration of capsicum and xanthoxylin, in connection with carbonate of ammonia, may also be used when the other means fail. As soon as reaction has occurred, small doses of aconite or veratrum may be given to control the fever; and iron, quinine, and general tonics during convalescence. If the disease be followed with apoplexy or cerebral inflammation, it should be treated accordingly.

INSANITY.

By insanity is understood all those conditions of the mind which deviate from a sound manifestation of intellectual power. Like that of disease, it is a somewhat difficult term to define; as what is the standard of intellectual equilibrium and strength in one individual, is by no means an indication of these same conditions in

others; yet there are certain morbid manifestations of intellect, that every individual, not affected by it, recognizes as insanity.

The indications of incipient insanity, which should excite alarm, are cephalalgia, vertigo, mental confusion, irritability and loss of temper occurring paroxysmally, inaptitude for usual occupations, a weariness of life, insomnia or lethargy, loss of memory, defective articulation, dimness of sight, and flightiness of manner. The patient feels, too, that he is not right; he shuns his old friends, has frightful dreams, is tortured with blasphemous or obscene thoughts, and usually suffers from dyspepsia. Mental diseases are also frequently associated with physical disorders, of which general paralysis and epilepsy are the most terrible.

Insanity, with general paralysis, is an incurable malady. The indications of the supervention of this disease, are defective articulation, a tottering, uncertain, and vacillating gait; the handwriting is changed, contraction of the affected muscles under the influence of galvanism, a heavy, vacant look, bluntness of the intellectual and perceptive faculties, fits of irritability, hallucinations, illusions, loss of memory, physical inexertion, loss of energy and decision, debasement of the mind, a feeble and frequent pulse, tremor of the tongue, lessening of the mobility of pupils, involuntary excretions, exaltation of the mind, hemiplegic seizures, attended with convulsions or coma. The latter generally disappear after the use of stimulating enemeta, and the removal of any collection of hardened fæces. As the disease progresses, there is loss of speech, grinding of the teeth, inability to walk or stand, and loss of all intelligence, which soon ends in death.

The *pathological characters* are, hypertrophy of the connective tissue, obstruction of the small arteries and veins in the pia mater, and degeneration of the cerebral mass, which leads to destruction of nerve cells and nerve tubes.

Insanity, with epilepsy, is also said, by Esquirol, to be incurable. It is characterized by the most ferocious, murderous, or suicidal aberrations, and, frequently, most filthy and disgusting.

Treatment.—Notwithstanding these forms of insanity are regarded as incurable, occasionally cases do recover. The patient, when it is practical, should be placed in some well regulated insane hospital; but where this cannot be done, he should be so secured as to pre-

vent his doing harm to himself, or to others. A careful investigation into the cause or causes giving rise to the disease, should be made, and a thorough treatment instituted to remove it. When associated with epilepsy, the treatment will be found under that head.

VARIETIES OF INSANITY.—MANIA.—Mania is characterized by general delirium, in which the reasoning faculty is disturbed and confused, if not lost; the ideas incontrollable, being abundant, erroneous, absurd, or wandering; and the conduct violent, excited, and extremely mischievous. Mania usually makes its incursion with the following premonitory symptoms, (it seldom appearing suddenly:)—Neglect of family and business, suspicion of friends, fits of anger and melancholy, without any cause, insomnia, etc. When the disease is ushered in, there is general delirium, and extreme fury. The symptoms cannot be fully described, as no one would dare to flatter himself that he has observed, and could describe all those peculiar to mania, even in a single case. In general, however, maniacs soon become weak and emaciated; there is a want of refreshing sleep, and frequently an abhorrence of food. There may be incontinence of urine, and an excess of phosphates in the secretion. If recovery take place, it is invariably preceded by sleep, a desire for food, and a gradual cessation of the agitation and delirium.

PUERPERAL MANIA, occurring almost immediately after delivery, manifests itself, usually, by restlessness, insomnia, severe cephalalgia, and a diminished mammary secretion. There may or may not be fever, attended with a quick and full pulse, and a thickly coated tongue. The delirium is frequently extreme, there being a tendency to suicide, or child murder. General irritability, and great debility, attend the affection.

MONOMANIA.—This form of insanity is characterized by mental aberration on one subject. The mind is vigorous; the ideas are few, erroneous, fixed, and not under control, and the conduct is in accordance with the predominant train of ideas. The monomaniac seizes upon a false principle, which he pursues logically, and from which he deduces legitimate consequences that modify his acts and

actions. Aside from this partial insanity, he often thinks, reasons, and acts like other men. Occasionally the symptoms are so obscure, that although the conduct, expression, and demeanor of the patient suggest mental delusions, yet nothing of the sort is manifested in the conversation. The insanity in such cases is frequently detected by the written letters.

Some authors have described that form which is characterized by fear, moroseness, and prolonged sadness, as *lypemania*, or *melancholia*. In some persons the depression and gloom become so great that the patient has a strong suicidal tendency (autophomania.) In other cases, he desires to destroy himself to get rid of the burden of life; while, again, he may regard it as a duty, which has perhaps been revealed to him, and with which he thinks it would be an unpardonable sin not to comply. This tendency, however, results from a long premeditated determination, not from any sudden impulse.

Another variety has been described as *moral insanity*, in which there is a perversion of the natural feelings, affections, temper, habits, and moral dispositions. Eccentricity of conduct, an uncontrollable destructive tendency, and a propensity to every species of mischief, are frequently the leading features.

In *theomania*, in which religion is the theme, the patient is apt to believe that he has received some direct revelation, or that he is commissioned of God to perform some important or miraculous mission. In *erotomania*, amatory delusions rule. It may be only an excessive degree of chaste and honorable affection, or it may be combined with *nymphomania*, or *satyriasis*. *Misanthropia*, another form, is characterized by aversion to man and society.

Dementia.—Dementia, or incoherence, is that condition in which weakness of intellect, induced by accident or old age, is the prominent feature. The mind is feeble, the ideas numerous, vague, confused, and wandering; the memory impaired, the manners childish, silly, and undecided. There are paroxysms of restlessness and excitement, and neither partialities nor aversions. Cerebral atrophy is a constant concomitant, its extent varying with the loss of mental power. Dementia is rarely cured, and in its last stage, there is complete paralysis.

Idiocy.—Idiocy is characterized by partial or complete absence of the intellect, owing to imperfect organization of the brain. It is congenital. The countenance is vacant, the articulation and gait imperfect, the mind undeveloped; there are but very few ideas, the manners are childish, with occasional transient gusts of passion, and occasionally the idiot is a blind, deaf mute.

Principal Causes of Insanity. Insanity is frequently hereditary, or it is sometimes traced to inter-marriages, or it may originate from a syphilitic or mercurial contamination which has been transmitted. Its more immediate causes are, however, the abuse of alcohol, narcotics, injuries of the head, sexual excesses, especially masturbation; continence, fevers, and the retrocession of erysipelas, or gout in persons predisposed. The moral causes are distorted views on religion, prolonged intellectual exertion, pecuniary reverses, blighted ambition, disappointment in love, immoderate grief, long-continued anxiety, and distress, etc. Defective nutrition of the brain, and complete insomnia, are often causes, and in those predisposed, local irritation may give rise to an attack.

Diagnosis. The diagnosis is not in many cases attended with difficulty, if the symptoms and history be carefully learned, and all the extrinsic circumstances be taken into account. The *prognosis* is most favorable when an acute disorder of the whole system, or some cerebral malady attended with fever, has constituted the commencement of the mental aberration; but in those cases in which the alienation of mind has slowly exhibited itself from the very commencement, fears may be entertained of confirmed insanity. When resulting from injuries to the head, sudden and severe calamities, protracted cares, or when complicated with general paralysis or epilepsy, it is usually hopeless. To form a correct prognosis, Dr. Noble well observes: "The causes, moral and physical, predisposing and exciting; the history of the invasion and progress; the actual state, and the reactions taking place under influences of any kind, must all be known and rightly appreciated, if an opinion is to be formed of the slightest value."

Pathology.—The parts affected in this disease are the brain, and nervous system, which may be symptomatic or organic. In either case, it may produce a depressed vitality, which manifests itself in a loss of tone and nervous power, confined either to the white or

gray nerve tissue, resulting in a morbid manifestation of mind, or body, or both. The gray nerve tissue may be found softened, and its cellular structure so impaired, as to render the development of nerve power inadequate to the demand, as is manifested by the demented condition of the intellect, and the irregular and spasmodic action of the various muscles and organs of the body. Chorea, muscular twitchings, an irregular gait, violent outbursts of passion, alternated with despondency, and great feebleness of mind, are indications of the ramollissement of the gray nerve tissue. It must be borne in mind, in studying the pathological conditions of nervous diseases, that both intellectual and vital force are developed in the gray nerve tissue; while their distribution is dependent upon the cortical, or white nerve tissue, and that although the gray nerve matter may generate sufficient nerve and intellectual power, if the white nerve filaments are not in a healthy condition, the physical and mental phenomena will be of a diseased character. In case of inflammation, hypertrophy, atrophy, softening, or induration of the neurilemma, the distribution of nerve force may either be irregular, spasmodic, or defective, as manifested in epilepsy, catalepsy, hysteria, chorea, and tetanus; or as in hemiplegia, paraplegia, and all the other forms of partial and general paralysis. In insanity, the pathological changes will depend upon such portions of the cerebral mass, as are involved in the manifestation of the peculiar intellectual faculties diseased. The researches of Gall and Spurzheim have amply demonstrated that each mental capacity has a corresponding physical organism in some portion of the cerebrum or cerebellum. Thus, if the insanity be of a religious character, involving reverence, benevolence and conscience, the superior portion of the cerebrum is the part in which pathological changes in the gray nerve tissue will be found to exist; so that by studying the physiological and phrenological relations of the mind to the different portions of the brain, we can infer the site of lesions in the various forms of insanity. Insanity, however, may not be confined to morbid conditions of the brain alone, as the entire nervous structure, together with most of the essential organs of the body, will frequently be found implicated in the pathological changes.

Treatment.—Upon making an examination of a patient who is supposed to have an unsound mind, the physician should use every precau-

tion in order to determine the real character of the malady, as in many cases the insane person, if aware of the object of the examination, will manifest so much shrewdness, and display so much sanity, that without the greatest precaution, the medical examiner is liable to be deceived. But a series of well-directed questions, however, upon the topics relative to which the patient manifests the greatest insanity, will soon reveal the real nature of the malady. After the diagnosis is fully established, the treatment resolves itself into, first, correcting those pathological conditions which either give rise to the disorder, or occur during its progress, and prove an exciting cause, aiding its perpetuity; second, the moral treatment, which consists in making such impressions on the mind as will contribute to a healthy condition of cerebral organism. Whenever the patient can be admitted into a well-regulated lunatic asylum, it is more than probable that in it the most effectual treatment will be applied. Where this cannot be done, it is the duty of the general practitioner to make such arrangements, and provide such opportunities, as will best secure the patient from harming himself or his friends. In no case should restraint be placed upon the patient, unless it be absolutely necessary. On the contrary, out-door occupation, lively amusements, fresh air, and daily bathing, often contribute largely to establish a cure. In connection with the above, all bad habits, as drunkenness, excessive mental labor, either from study or business, masturbation, excessive venery, high living, and every other vice that may contribute to the disease, should be removed. In females, a careful investigation of the uterine functions will be required, and all catamenial irregularities should be promptly attended to. Next in importance is the attention to the stomach and bowels, as we have previously stated deranged mental action is nearly always connected with a morbid condition of these organs. The stomach should be frequently evacuated by a lobelia emetic, and the bowels cleansed by full doses of sulphate of soda, or the sulphate of magnesia. The emetic and purge should be repeated as often as required to maintain the stomach and bowels in a healthy condition. At the same time, tonics, such as alnuin, iron, phosphorus, strychnin, hydrastin, and occasionally the mineral acids, should be given to improve the general health of the patient. In addition to this tonic and restorative plan of treat-

ment, much specific medication has been resorted to. At one time bleeding, cupping, and blistering, in connection with a strong antiphlogistic treatment, and regimen, was almost universally resorted to, but modern practice has nearly discarded these means, and now only moderate general bleeding is practised in extreme plethora or cerebral inflammation, while cups and blisters are sparingly used for the same purpose. Among the medicines that stand in the highest repute for this disorder, are cypripedin, scutellarin, cannabus indica, canabus sativa, apocynin, iodide of potassa, ammonia, belladonna, gelsemin, gelseminim sempervirens, aconite, veratrin, strychin, iron, quinine, opium, and lupulin. Cypripedin has been proved to manifest a specific action on the brain and the power of controlling the molecular manifestation of the gray nerve matter; hence, in those cases where there are indications of cerebral softening, it may be administered with much advantage in five or ten grain doses, four or five times a day, combined with two grains of hypophosphite of iron. During this treatment, sleep may be induced by a few grains of lupulin, or one or two grains of extract of canabus indica. If this should fail, from one-half to one grain of opium may be added to the mixture, and administered every night. If this treatment should be unsuccessful, the iodide of potassa, strychnine, and other remedies, should be used as the nature of the case may indicate. Of the moral treatment, the judgment of the practitioner alone must direct it. In all cases the utmost kindness and sympathy of the physician should be manifested, all manner of extravagant ideas of the patient tolerated, and all complaints most carefully listened to and appreciated. In no case should the physician attempt to deceive or make mis-statements, as persons laboring under disordered mental action are quick to perceive the truth, and soon lose confidence in their attendant, whenever they notice he diverges from the truth. Showering the head and frequent shower baths, in connection with the other treatment, has also proved of much value. During the entire management of the case, no captious argument should oppose the lunatic's views, or irritate his already too much excited brain. By a careful study of the works of Gall, Spurzheim, and Andrew Combe, much information may be obtained as to the peculiar kinds of insanity.

ALCOHOLISM.

The various pathological effects of alcohol are considered as incident to a toxical condition of the animal economy, called alcoholismus. Its effects enter directly into the cause of many affections, such as cirrhosis of the liver, fatty liver, gastritis, epilepsy, pyrosis, muscular tremor, and Bright's disease. Indirectly, it favors the production of nearly all difficulties, by lessening the power of resisting their causes, and contributing to their fatality by impairing the ability to tolerate and overcome them. It affects directly the brain and nervous system. When taken in a large quantity, it may immediately destroy life. The habitual use of smaller quantities, produces a most deleterious influence, and may give rise to delirium tremens, or dipsomania.

Delirium Tremens.—Delirium tremens, commonly termed *mania a potu*, is an affection which follows the sudden withdrawal of the habitual use of alcoholic stimulation; its essential character consisting in the cerebral debility, consequent upon this suspension. Its most prominent characteristics are delirious hallucinations, fear, muscular tremors, weakness, watchfulness, and the want of sleep. The natural tendency is to terminate in a critical sleep, at the end of two or three days from the commencement of the delirium. Men are more subject to it than women. The habitual use of opium, excessive mental excitement, and venereal excesses, will occasionally produce an affection resembling it.

Symptoms.—The symptoms attending delirium tremens, are anorexia, insomnia, muscular tremors, hallucinations of sight and hearing, a dread or suspicion of every one, indescribable anxiety and agitation, mental and physical prostration, and a generally excited and eager manner. There is no pain in the head, nor febrile movement; the skin is commonly moist or clammy; the face pale, but often flushed, with a wild expression; the tongue moist and covered with a white fur; the pulse frequent and soft, and the bowels constipated. This state is known among drunkards as "*the horrors.*" The symptoms generally become aggravated towards night, while early in the morning, there appears to be greater weakness. In severe cases, there is an increase of the sulphates in the urea, with a diminution of the phosphates.

The development of the disease is characterized by a peculiar mental aberration. Frequently the patient will not admit that any thing ails him, but he answers questions rationally, puts out his tongue in a tremulous manner, and does whatever he is bidden at the moment. Then he begins to wander again; the expression becomes wild, the eyes either vacant or staring; the movements are quick; there is incessant restlessness; the hands are in tremulous motion; he talks incoherently; his mind wanders from one subject to another; he fancies he has important business to do, speaks of going out, gives orders to absent servants, etc. There are also illusions of the senses, phantasms, and hallucinations of every kind. He sees imaginary objects, such as rats, mice, lice, dogs, cats, snakes, and ferocious animals, and hears and imagines the most extraordinary and absurd delusions, of which the most striking are those characteristic of fear.

In favorable cases, the critical sleep comes on about the beginning of the third or fourth day, when the patient falls into a sound slumber, which may continue for twelve, eighteen, or twenty hours. From this he awakes cured of his disease, though very feeble, pale, and trembling. In cases terminating fatally, the watchfulness continues, and is followed by muttering delirium, subsultus tendinum, exhaustion, coma, or convulsions. Death usually occurs suddenly, the patient being active in his delirium until the moment he ceases to breathe.

Delirium Ebriosum, though differing pathologically from delirium tremens, yet may be confounded with it. The delirium is of an active type, characterized either by violence or fury, or hilarity, and is due to cerebral congestion, combined with the immediate effect of alcohol on the brain. It is accompanied by pain in the head, increased heat, throbbing of the carotids, and febrile excitement. Its duration is brief, ceasing when the stimulants are discontinued.

Dipsomania is a term employed to express an insatiable desire for intoxicating liquors, which, according to some physicians, partakes of the character of insanity.

Treatment.—In the treatment of delirium tremens, much diver-

sity of opinion exists as to the propriety of immediately withdrawing the use of alcoholic stimulants. Dr. James McClintock thinks it advisable not to suspend the use of the stimulants at once; hence he is in the habit of prescribing two or three ounces of good whisky, four or five times a day. Dr. Garrod, and many other practitioners, resort to the same. I have usually omitted alcoholic stimutants, and depended upon other means. In the first place, a thorough lobelia emetic should be given, if called in the early stage of the disease. Immediately after it has been taken, an alcoholic spirit sweat should be administered, followed by a mild laxative, such as citrate of magnesia, or leptandrin and neutralizing mixtures. If there be nausea and vomiting, a hot mustard paste should be applied to the epigastrium, in connection with hot mustard pediluvia. The next effort should be made to procure rest or sleep. This can usually be effected by the following pill:—Take lupulin and cypripedin, of each one grain; hyoscyamin, one-fourth of a grain; and strychnin, one-twentieth of a grain; mix, and make a pill. It should be swallowed in the evening, and if not followed by sleep, should be repeated every two or three hours. If there be delirium with phantasms, five drops of the essential tincture of belladonna should be added to a tumblerful of water, and a teaspoonful administered every ten or fifteen minutes. If there be much tremor, with an irregular pulse, and a tendency to coolness of the extremities, from one-tenth to the one-twentieth of a grain of gelsemin should be administered once or twice a day. If there be great prostration, one or two grains of carbonate of ammonia, and one-fourth grain of camphor should be taken every two or three hours. If the strength should still fail, from a teaspoonful to a tablespoonful of whisky, added to a little water, may be drunk. When there is great nausea and vomiting, one drop of prussic acid, added to a small quantity of water, may be taken every hour or two. Creasote has been successfully used in this condition; from one-half to one drop may be given instead of the prussic acid. Iodide of potassium, in five or ten grain doses, administered every two or three hours, has also been highly recommended. I have treated a large number of cases quite successfully, after the emetic, spirit sweat, and purge, by administering ten grains of capsicum in a tablespoonful of fresh cream, every two or three hours. Opium and morphine have also been exten-

sively used to procure sleep. Twenty or thirty drops of Munn's Elixir of Opium, will sometimes operate very favorably. The diet should consist of beef tea, chicken broth, and bread coffee. The body should be frequently sponged in tepid water; the room kept dark and quiet; and the windows securely fastened to prevent the patient from injuring himself during the paroxysms. The bowels may be maintained in a regular condition by stimulating enemeta. Delirium embriosum can be cured by abstaining from alcoholic stimulants; and dipsomania by regulating the bowels, and the administration of small doses of nux vomica, two or three times a day.

CEPHALALGIA, OR HEADACHE.

Cephalalgia, or headache, is frequently a mere symptom of idiopathic disease, yet we often meet with cases where this difficulty constitutes the only perceptible ailment. The great point to be remembered in the pathology of headache, is that it depends upon irritation of some portion of the nervous tissues, or upon directly opposite conditions: in the one case the nervous irritation depending upon congestion, or an undue amount of blood; and in the other, there is an anæmic state, or too little blood supplied to the nervous matter. It may be caused by a preternatural determination of blood to the brain, the too frequent use of intoxicating liquors, a disordered condition of the stomach and bowels, a loss of balance between the venous and arterial circulation, an injudicious use of tea or coffee, undue mental or bodily exertion, imperfect menstruation, the too frequent use of purgative medicine, tobacco, sexual indulgences, self-pollution, irregular eating, constipation, and various occupations which require a stooping posture for a great length of time.

Cephalalgia, in its widest acceptation, includes all uneasy sensations in the head. It may be confined to one spot, as if it proceeded from a nail driven into the head, may occupy a particular region of the cranium, or embrace one side, as in hemicrania, or it may be diffused, and of indefinite extent. It may be felt in the depths of the brain, or only in the scalp and cranium, and continue for an instant, or last for days or weeks. It generally occurs in paroxysms, with intervals of comparative ease, sometimes assuming an intermittent or remittent type. The pain may be simple, or

mingled with sensations of weight or lightness, distention or fulness, emptiness, heat or coldness, hissing, buzzing, ringing, or roaring in the ears, and imperfect vision.

Headache is almost a constant attendant on the different forms of inflammation of the brain; and its character determines, to a certain degree, the seat and nature of the cerebral disease. It is usually the first sign by which tumors, hydatids, and other morbid growths of the brain are presented. In the nervous form, it is very frequently sympathetic of disease of the stomach or liver, of worms, constipation, and other disordered conditions of the bowels, of spinal irritation, and of renal and uterine difficulties. It is sometimes dependent on decayed teeth. When it is confined to one side of the head, or to a temple, it is usually of a neuralgic character, being sharp and lancinating. When associated with a disordered stomach, it occurs in the forehead or temples, and is frequently attended with languor, drowsiness, and dizziness. When it arises from a congestive state of the brain, it is of a dull, heavy, aching character; but a feeling of lightness, rather than fulness, is experienced, when it results from a directly opposite or anæmic condition. If there be a protracted pain in the top or back part of the head, there is probably some irritation along the spinal cord, or derangement of the genital organs, most likely resulting from masturbation, or excessive sexual indulgence. It may also be produced by malarial influences, and is frequently one of the forms of masked ague.

Treatment.—Immediate relief may frequently be obtained by thoroughly evacuating the stomach, and drinking large draughts of hot composition tea, followed by adding ten drops of the tincture of belladonna to a tumblerful of water, and taking one teaspoonful every ten or fifteen minutes. A hot foot bath, and bathing the head in stimulating liniments, also afford relief in some cases. As soon as the paroxysm ceases, the cause should be sought for, and, if possible, removed. When resulting from a full habit, and congestion of the brain, a low diet, and occasional saline purges, will remove it. If attendant upon disordered catamenia, attention to the uterine functions will be required. In debility, tonics, a nutritious diet, outdoor exercise, and baths, should be prescribed. When produced by tea, coffee, alcoholic stimulants, and high living, avoiding the cause will remove the effect. In addition to the temporary relief suggested, the

inhalation of volatile stimulants, such as ammonia and camphor, may prove beneficial. Anæsthetics may also be inhaled, such as chloroform, ether, nitrous oxide gas, etc.; and where it originates from a malarial influence, quinine and iron will remove it. In some bad cases, cold applications to the head, leeches to the temples, and hot sinapisms to the spine, may be required.

SPINAL MENINGITIS.

Spinal meningitis consists of an inflammation of the membranes of the spinal marrow, in which the medullary substance of the cord is more or less involved. When acute, it may be associated with disease of the cerebellum, or of the membranes of the cerebrum; while, when chronic, with caries of the vertebræ.

Symptoms.—In spinal meningitis we have pain either of a dull, aching, gnawing, or sharp, lancinating character, extending along the spine and the limbs, aggravated by motion and pressure; attended with rigidity or tetanic contraction of the muscles of the neck and back, varying in degree, but occasionally amounting to opisthotonos; constriction in the neck, back, and abdomen, high fever, insomnia, feebleness of the limbs; terminating, occasionally, in paralysis; suffocating sensations, obstinate constipation, retention of urine, priapism; succeeded by great prostration, feverish delirium, and coma. The disease may terminate either in resolution, effusion of serum, or in softening or suppuration. The duration of the acute form varies, from four or five days, to two weeks.

The *chronic* form, which occurs much less frequently than the acute, commences with a dull pain in the spine, with more or less deranged symptoms in the extremities, and unusual fatigue after exertion. Little apprehension is caused, until paralytic symptoms develop themselves. Functional derangement of the thoracic, abdominal and pelvic viscera, involuntary startings of the muscles, and sometimes tetanic contractions, mingle with the approaching paralysis. The patient, finally worn out by insomnia, irritability, and physical prostration, dies in a state of profound coma, having suffered, perhaps, for weeks, months, and even years.

Males appear to suffer more frequently than females, and it is most common between the second and seventh year, and the twentieth and twenty-fifth.

Causes.—Exposure to wet and cold, in rheumatic subjects, appears to be its most frequent cause. Mechanical injuries, violent muscular exertion, intemperance in eating and drinking, atmospheric vicissitudes, metastasis of inflammation from other parts, animal and vegetable miasm, alcoholic stimulation, mental excitement, and venereal excesses, may act as exciting causes.

Diagnosis.—Spinal meningitis may be confounded with myelitis and rheumatism of the spinal ligaments. From the former, it is distinguished by the tetanic contractions and flexion of the limbs; and from the latter, by the history of the case, and by the pain produced by pressure being most severe on the spinous processes, while in rheumatism, it is greatest along the side of the spine.

Anatomical Characters.—The characters presented upon dissection are, great congestion, effusion of serum or pus, and sometimes softening of the cord. The medullary substance is rarely softened, excepting in cases attended with paralysis.

Prognosis.—Though a dangerous disease, yet it is not necessarily fatal. The majority of cases, if attended to properly in time, may be arrested, although an attack strongly predisposes to others.

Treatment.—The treatment of inflammation of the spine and its membrane, does not differ essentially from that of the brain. The bowels should be opened by antibilious physic, and in case of a vitiated stomach, it should be evacuated by a lobelia emetic. The febrile condition should be controlled by aconite or veratrum; and in sthenic forms of inflammation, ice bags may be applied along the entire spine, while, in the asthenic, cups and leeches should be used instead of ice. The cupping and leeching should be followed by hot packs, frequently renewed. Where the inflammation terminates in effusion into the theca of the spine, iodide of potassa should be given in two or three grain doses, every two or three hours, in connection with one-half dram of the compound fluid extract of pareira brava and diosma, until the effusion be absorbed. When there are indications of ramollissement, prussic acid, strychnin, and phosphorus, are there medies. Chafing liniments, applied to the spine, also have a good effect in certain conditions of the disease.

CEREBRO-SPINAL MENINGITIS.

Cerebro-spinal meningitis has recently attracted considerable attention, owing to its occurrence in the form of an epidemic in various parts of Europe and the United States, attacking especially young persons and males. Thus, in Ireland it has occurred most exclusively in boys under twelve years of age, and in France among the young recruits. In 1837 it commenced in the south of France, and gradually extended over the whole country, prevailing most extensively in garrisoned towns. According to M. Rollet, who described the disease as it prevailed in Nancy, it occurred in two forms; in the one, all the inflammatory symptoms of the meninges were present; and in the other, there was also an affection of the intellectual faculties, and of sensation and motion, with more or less complete abolition of all the senses. Upon dissection in the latter form, there was great vascularity of the cerebral arachnoid, a layer of plastic purulent matter covering the inner surface of the pia mater and the brain, and a collection of the same matter beneath the spinal and cerebral arachnoid. The cerebrum was somewhat punctated, the cerebellum softened, the choroid plexus injected, and the arbor vitæ of a blood-red color. Opposite the third and last dorsal vertebræ, a considerable quantity of pus was collected. The substance of the spinal cord appeared healthy. These lesions correspond precisely to those described by Chauffard, Faure-Villar, and Forget, as occurring in the disease as it prevailed in Versailles, Avignon, and Strasburg.

According to Dr. Mayne, who gives an account of it as it occurred in Ireland in 1836, its general pathological characters were usually similar. The serous membrane covering the brain and spinal marrow was always found to be the seat of great inflammation, the spinal arachnoid invariably suffering more severely than the cerebral. In many of the cases reported, the brain and spinal marrow have been stated to be occasionally implicated, in some the inflammatory effusions were contained in ventricles of the brain, and the choroid plexus appeared unusually vascular; in others, more or less of the substance of the brain and spinal marrow was found in a state of softening; sometimes, sero-purulent effusion was detected in the theca vertebralis, and at the base of the brain;

but in every instance, the serous membrane was the portion particularly involved, while the nervous material seldom suffered.

In 1848, the disease made its appearance in this country. In 1857, it prevailed extensively in central and western New York, in an epidemic form. Since that time, numbers of cases have occurred in different sections of our country, but not to any very great extent. Whenever it has occurred epidemically, the mortality has been very great, not less, in some cases, than seventy or eighty per cent. It appears most frequently in low, moist localities, during warm weather in the Spring months, and in the warm, wet weather of November and December. A low, electrical state of the system, caused by a damp atmosphere, is a strong predisposition to this disease. There is no doubt that a morbid animal or vegetable poison enters the blood through the skin, stomach, and lungs, causing the disease.

Symptoms.—The symptoms usually are of a formidable character, and their occurrence frequently sudden and unexpected. Usually, however, it approaches gradually with a slight derangement of the stomach and bowels, chilliness, headache, pain in the back, and stiffness of the muscles of the neck. When fully set in, there is intense cephalalgia, vertigo, delirium, restlessness, an anxious expression, intolerance of light and sound, a cold surface, and an irregular and intermittent pulse. The muscles become spasmodically contracted, the head is drawn back or to one side, and in some cases there is stiffness of the whole body; and finally, coma and paralysis supervene, and the patient dies, unless a change for the better take place.

In the more severe cases, there is first a feeling of indisposition, followed soon by severe chills, or the congestive stage, with coldness of the surface, acute abdominal pains, irregular pulse, and coma. The patient sometimes sinks, with perhaps violent purging and vomiting, into a collapsed state, resembling that of cholera, in which form death may take place in a few hours. Or if reaction take place, there is violent headache, and pain along the spine, increased sensitiveness to light and sound, delirium, convulsions, rigid spasms or cramps, drawing the head stiffly backward, and sometimes rendering the whole body almost as rigid as a board. In some cases the countenance assumes a peculiar tetanic expression,

and there is partial or complete deafness. High febrile excitement occurs, the skin is very hot, the pulse full and frequent, varying from 120 to 140 per minute, the respiration is irregular and laborced, there is insatiable thirst, vomiting, and epigastric tenderness. Typhoid symptoms may manifest themselves, as a dry tongue covered with sordes, feeble pulse, prostration of strength, petechiæ, great restlessness, with excessive irritability, till profound coma and death terminate the sufferings. During the early stage, the tongue may remain nearly natural, or be covered with a white or yellowish fur, but during the latter forms, it becomes dry and reddish, or covered with a brownish coat, and instead of diarrhœa, there may be constipation from the very commencement. The petechiæ are a prominent symptom, appearing usually the second day on the face, neck, and breast, and then extending over the entire body.

Another peculiarity of this disease, and one that has given it the name of "*spotted fever*," is the early and frequent appearance of ecchymosis, usually first manifesting itself about the chest and abdomen in the form of dark purple patches, which in many cases extend to all portions of the body. They may be small or of considerable size, giving the patient a mottled appearance. I have seen cases where this peculiarity was a most prominent feature, and involved nearly all portions of the integument. These discolorations, however, have no relation to the petechiæ, or eruptions which occur in typhus and typhoid fevers, but are the result of the stagnation of blood in the peripheral capillaries, which usually disappear upon convalescence. The ecchymosis is not a diagnostic indication of the disease, as many marked cases of cerebro-spinal meningitis occur without its presence.

The most striking characteristic of the disease, is that presented by the condition of the muscular system, particularly the muscles of the neck, which draw the head upon the vertebral column, and firmly fix it in that position, so that the patient is unable to move it forwards. Rigidity is also very commonly observed in the muscles of the extremities, the patient losing the power of moving his limbs, and of assuming the erect posture. In some instances there is a quivering motion of the muscles of the face, with tremors of the hands, and embarrassment of the movements of the extremities,

or spasmodic twitchings in the flexors of the limbs, with a disposition to constant movement of the legs alternately from side to side. In many cases, there is a difficulty of prehension, it being difficult for the patient to drink water from any vessel without assistance. Involuntary twitchings of the muscles are sometimes produced, whenever the patient attempts to move, or seize any thing; or whenever the inferior extremities are raised up, or merely touched. There is great irregularity as to the period when the tetanic symptoms occur. They may set in as early as the first day of the attack, or not until the lapse of several days.

The duration of the disease is very variable. Death may occur within a few hours from the commencement of the attack. The majority of cases terminates about the fourth day; some, however, are protracted to over fourteen, twenty, or even fifty days. Convalescence is usually slow and lingering.

Anatomical Characters.—These are similar to those presented in cerebral and spinal meningitis. The meninges of the brain and spinal cord are more or less congested, but the most striking characteristic is effusion of lymph into the arachnoid and pia mater.

Prognosis.—The prognosis of this disease is usually unfavorable; but, by prompt and energetic treatment, cases may recover.

Treatment.—The treatment of cerebro-spinal meningitis, or spotted fever, should be commenced by an active lobelia emetic, followed by a brisk purge of podophyllin and leptandrin, provided the physician be called in the early stage of the disease; but if not called until the disease is somewhat advanced, the emetic may be omitted, and the treatment commenced with the following remedies:—Take oleo resin of lobelia, ten grains; capsicum, twenty grains; podophyllin, five grains. Mix, form a pill mass, make ten pills, and give one every two or three hours, until they act upon the bowels. The above compound will produce active reaction. Even in cases where there is extensive collapse, it also produces diaphoresis, copious discharges of urine, and free evacuations from the bowels, without inducing debility. In a few cases I have known it to be followed by nausea and vomiting, but even then almost immediately followed by an amelioration of all the urgent symptoms. If the emetic and purge be first given, the podophyllin should be omitted from the pill, and the same amount of viburnin added. As soon as reaction

has been produced by the pill, a full round of quinine and iron should be given, say from ten to twenty grains of quinine, and one dram of prussiate of iron divided into six or eight powders, and one given every two or three hours. If the powders increase the excitement, either the tincture of veratrum or lobelia should be given in sufficient quantity to maintain a natural frequency of the pulse, and a moisture of surface. In the commencement of the treatment, as well as during its progress, hot baths, frequent spongings of the body, and hot packs to the spine, will prove of the greatest value. In some cases, ice, mustard pastes, cups, leeches, and blisters, have been successfully resorted to as topical treatment, instead of the hot packs. If, after the above treatment, there should be opisthotonos or emprosthotonos, from one-twentieth to one-fortieth of a grain of strychnin, and one-tenth of a grain of gelsemin should be given every hour or two until that symptom is relieved. When extensive ecchymosis occurs, indicating great capillary congestion, bathing the body in the tincture of capsicum, followed by brisk friction, will prove of the greatest benefit. In the stage of prostration, camphor, ammonia, xanthoxylum, and capsicum, are indicated.

When symptoms of a typhous character still manifest themselves after the above treatment has been properly applied, two or three drops of muriatic acid should be given every two or three hours, in connection with hot cream punch, made by taking equal parts of hot water and cream, and adding to each half pint one tablespoonful of good French brandy. Let this be drunk at a dose, and repeated four or five times a day. Where there is a tendency to stupor, add five drops of the tincture of belladonna to a tumblerful of water, and give one teaspoonful every half hour, or hour. If symptoms of paralysis occur, give cypripedin, hypophosphite of iron, and prussic acid, either separately, or in such combinations as the case indicates. When there is active delirium, the head may be shaved, and ice-bags applied in the active form of the disease; but in the typhoid, hot evaporizing lotions should be used, instead of the ice. Blisters applied to the nape of the neck, have also proved of value in some cases. Cupping the temples, and along the cervical portion of the spine, may also be resorted to. The feet should be kept warm, and the convalescence carefully guarded.

MYELITIS.

Myelitis, or inflammation of the substance of the spinal cord, is characterized by the following symptoms, when the *cranial* portion is affected:—Deep-seated headache, convulsive movements of the head and face, indistinct articulation, trismus, difficult deglutition, impeded spasmodic breathing, irregularity in the action of the heart and pulse, hemiplegia, and as the fatal stage advances, great prostration, feeble circulation, increased dyspnœa, and involuntary excretions. When it is situated in the *cervical* portion, the symptoms are difficult deglutition, inability to raise or support the head, acute pain in the back of the neck, great dyspnœa, a sense of pricking and formication in the arms and hands, and paralysis of the upper extremities. *Dorsal* inflammation is characterized by pain in the dorsal region, numbness or pricking sensations in the fingers and toes, convulsive movements of the trunk, paralysis of the arms and lower extremities, short and laborious respiration, great palpitation, etc. When the *lumbar* portion is affected, which is most commonly the case, the paralysis becomes more marked: there is great pain in the abdomen, with a sensation as of a cord tied tightly around it, convulsions or paralysis, retention and incontinence of urine, and involuntary stools. When the inflammation affects the whole surface of the cord above the origin of the phrenic nerves, life is immediately extinguished by the cessation of the action of respiration. The pain in the affected cord is always less severe than in meningitis.

Causes.—It is usually excited by cold and damp, wounds, and contusions, while sometimes it occurs during the progress of fever.

Anatomical Characters.—Ramollissement is the most frequent result. Sometimes one portion of the cord is softened, while the other is indurated. Abscesses have occasionally been discovered.

Prognosis.—Although the prognosis is always grave, yet when the inflammation is only of short duration, and particularly when only the lumbar region is affected, cases may recover.

Treatment.—Inflammation of the substance of the spine is of rare occurrence as an idiopathic disease, but is a frequent complication of fevers. When it exists as an independent affection, after attending to the general condition of the emunctories, aconite should be

given to control any febrile excitement that may exist, and strong counter-irritation applied along the entire course of the spine. A very good application is to take four ounces of the compound tincture of myrrh and capsicum, and two drams of Croton oil. It should be applied with friction. The surface should be frequently bathed in hot water and soda. As soon as the active form of the inflammation is removed, ten grains of valerianate of quinine may be mixed with five grains of hypophoshite of ammonia, and one dram of white sugar, divided into ten powders, and one given every two or three hours. This may be followed by cypripedin, hypophosphorous acid, prussic acid, carbonate of ammonia, strychnin, and general tonics. The diet should be nutritious, and the bowels kept open by small doses of sulphate of magnesia.

ORGANIC DISEASES OF THE SPINAL MARROW.

Hemorrhage.—Effusion of blood into the spinal cavity, or into the substance of the cord, is produced chiefly from blows and falls, over-exertion, acute inflammation of the cord or membranes, fatty degeneration of the coats of the blood-vessels, and caries or other disease of the vertebræ. When the effusion is copious, death may immediately ensue, or a fatal result may take place after the lapse of some time, owing to chronic softening of the cord.

The *symptoms* depend upon the seat of the ruptured vessel. When the effusion occurs between the membranes, it will necessarily gravitate to the lowest part of the spinal canal; and hence will arise paralysis, which gradually ascends. There will also be acute and sudden pain in the back, and occasionally in the head, difficult breathing, severe convulsions, depression of the action of the heart, a pale and cold surface, and loss of consciousness.

Tumors.—Paralysis may arise from the long-continued pressure of tumors upon the cord, producing partial atrophy. The morbid growths consist either of tubercle, cancer, bone, or hydated cysts. Exostosis of the odontoid process of the second cervical vertebra, has occasionally been observed. The *symptoms* approach very slowly, paralysis, occasionally, not occurring until there is great pressure. There is usually pain over the seat of the growth, cramps, and convulsive movements of the extremities. The disease is gene-

rally due to scrofula, syphilis, or cancer. The prognosis is always unfavorable.

Hydrorachis.—Hydrorachis is applied to abnormal collections of fluid within the spinal column. It is generally congenital, and associated with *spina bifida*. In such cases, one or more semi-transparent tumors, containing fluid, are observed over the cervical, dorsal, or lumbar vertebræ. The arches and spinous processes of the vertebræ are wanting in the situation of the tumors; the walls of the latter being formed of skin and the spinal membranes. When it is present for some time, it produces atrophy of the cord.

Hypertrophy, *atrophy*, *non-inflammatory* softening of the spinal cord, and *concussion*, have occasionally been observed.

Treatment.—The treatment for spinal hemorrhage, is to apply ice along the spine to check the effusion of blood, and to promote absorption by means of iodide of potassium, chimaphilin, and colchicum. In tumors of the spine, iodide of potassium, cod liver oil, a nourishing diet, and the application of iodine liniments, should be the medical treatment; while hydrorachis should be treated by absorbents, iodine liniment, the application of the irritating plaster, and, when practicable, puncture, to allow of the escape of the fluid. Spinal concussion should be treated with galvanism, stimulating liniments, and tonics.

SPINAL IRRITATION.

This affection might be more properly designated as chronic inflammation of the spinal marrow, and its membranes. In fact, the various morbid changes observable as the symptoms of what is usually designated spinal irritation, such as softening, effusion, hypertrophy, etc., all clearly indicate the previous existence of a latent inflammatory process.

Symptoms.—As Prof. Jones remarks, the proteian manifestations of spinal irritation, and the great liability that exists to mistake some of the numerous disturbances produced by disease seated in the spinal nerves, for other and more serious organic affections, remote from the source of trouble, renders the consideration of this subject scarcely less important to the student of medicine, than that of any other topic connected with disease. Scarcely an organ in

the body can be found that is not by turns made the scapegoat upon which these great nervous centres play off their fantastic representations of serious organic or functional disturbances, and thereby mislead the unsuspecting attendant, at the expense to the patient, of a severe course of medication directed to disease having its real seat far remote from the organ manifesting embarrassment and functional disturbance. Hence it will be perceived by these that irritation of the spinal marrow assumes a great variety of symptoms.

Not unfrequently females who are troubled with the latent form of spinal affection, exhibit symptoms of uterine derangement, heart disturbances, irritation of the lungs and bronchi, irregularity of the bowels, neuralgic pains, etc., succeeding each other in a rapid series of changes. The diagnosis must be made up, in these cases, by carefully examining each organ, thus sympathetically affected, by itself; and in the absence of any serious organic disease, together with the extreme nervousness of the patient, it will enable us to arrive at the true source of the complaint. On pressure of the spinal processes, there will generally be found more or less tenderness, although I have seen a large number of cases of evident spinal irritation where this symptom was not present.

Treatment.—In cases of spinal irritation, the irritating plaster should be applied along the diseased part of the spine, and caused to remain until a free discharge ensues, and the following tonic and alterative given:—Take phosphate of iron, thirty grains; scutellarin, twenty grains; syrup of iodide of potassium, three ounces; port wine, one pint; mix, and give one tablespoonful three times a day. The surface should be bathed in warm or cold water, as indicated, twice or three times a week; and the bowels kept regular by the use of small doses of neutralizing mixture. When the above course has been pursued for some time, and the disease is not removed, the following compound may be given:—Take valerianate of quinine, twenty grains; cypripedin, ten grains; sanguinarin, twenty grains; white sugar, one-half ounce; mix, triturate, and give ten grains four or five times a day. Also, bathe the spine in a warm solution of ferrocyanide of potassium, every morning. If there is leucorrhœa connected with the spinal difficulty, macrotin and caulophyllin should be given in addition to the above. Iodide

of ammonia and potassium may also prove of value, in connection with cod liver oil.

HYPOCHONDRIASIS.

The symptoms of this disease are exceedingly various, and are both imaginary and real. The imaginary ones are numerous, such as want of sleep, constipation of the bowels, etc. Nothing is more common than to hear the patient state that he has been unable to close his eyes in sleep for several nights, when the fact is that he has slept regularly. Or, that the bowels have not moved for days, or even weeks, when they are perfectly regular. Or there may be a great variety of imaginary difficulties at the same time. The complaints of one individual that I treated for this disease will serve to illustrate the imaginary symptoms of this class of cases: The patient was a male, about forty-five years of age. He first complained of inability to walk, and accordingly took to his bed. He was soon unable to speak above a whisper, and imagined he was laboring under an attack of acute phthisis, and, as he said, had excessive dyspnœa and violent cough, although he neither coughed nor apparently had any difficulty of breathing. He also complained of an entire loss of appetite, and inability to take food, yet he eat three hearty meals daily. At times he thought he was about to die from an extensive affection of the heart; and also that his liver and kidneys were consumed. In short, he was composed of a congeries of all the ills that afflict the human family. He continued in this state for twelve years, only leaving his bed for a few minutes at a time, and then with great difficulty. During the whole period, he only spoke above a whisper, except when angry. He would then become very boisterous, and talk exceedingly loud, which in one or two instances lasted for several days. But when the fit passed off, he was as seemingly incapable of speech as before. On examination, no apparent disease existed further than the natural debility dependent upon so long confinement. By a proper course of mental and physical treatment, he soon recovered, and resumed his ordinary occupation, that of farming. And although it is now over ten years, he has enjoyed uninterrupted good health. Females who are afflicted with this diseased condition of the mind

often imagine they have some severe uterine derangement. And frequently the medical attendant, being as ignorant of the cause of the disease as herself, subjects her to a very disastrous course of medication. Another class of patients afflicted with hypochondriasis have, in addition to the imaginary symptoms, some real organic affections which require especial treatment.

Hypochondriasis, no doubt, is induced by a want of harmonious action between the different organs of the brain.

Treatment.—The treatment of this malady should consist principally in quieting, as far as practicable, the already excited faculties of the brain, and bringing other faculties into action. The mind should be constantly directed to other subjects than those to which it has been previously directed; and those subjects should be sufficiently exciting to arrest his former meditations. The head should be frequently showered in cold, and the body in tepid water. He should be induced to take as much exercise as his enfeebled condition will warrant. The bowels are to be regulated by mild aperients, and in some cases chalybeates and vegetable tonics will be required. If the disease is complicated with other organic affections, it should be treated accordingly.

NEURITIS.

Neuritis, or inflammation of the nerves, is generally due to a bruise or wound, or to inclusion of some branch by a ligature in taking up an artery. It is characterized by severe and continuous pain extending along the trunk and ramifications of the nerve. The constitutional symptoms vary according to the extent of the inflammation; but there is usually fever, and great restlessness at night. In chronic cases, the symptoms are those of neuralgia. It may also arise spontaneously in gouty or rheumatic persons.

The pathological changes observable in the affected part are, enlargement of the nerves, reddening of the neurilemma, dilatation of vessels, and specks of extravasation of blood. In some instances, serous, sero-purulent, and purulent infiltration have been noticed.

Treatment.—When a nerve has been included in the ligature upon ligating an artery, the nerve should be divided both above and below the point. When it occurs from other causes, the fever

should be controlled with aconite, and one teaspoonful of the neuralgia mixture given every two or three hours. Phosphorus, iodide of potassium, cypripedin, iron, and cod liver oil will also be indicated when chronic inflammation of the nerve exists.

NEUROMA.

By the term neuroma is understood a tumor connected with a nerve, of a solid or cystic character. The solid growths are of a fibrous character, consisting of dense plastic material, implicating the neurilemma and nerve fibres. When they form spontaneously, they are generally single and very painful. They may also result from injuries, and especially of amputation. They vary in size from a pea to that of a human head, and occur most frequently on the spinal nerves. Their growth is steady and slow. It is occasionally due to neuritis, but generally no appreciable cause can be detected. It may in some instances produce epilepsy or hypochondriasis. In traumatic neuroma the growth is usually single, and is the source of severe paroxysmal pains.

Treatment.—A strong iodine liniment should be applied to the tumor two or three times a day, and once or twice a day a strong current of galvanism passed through it for twenty or thirty minutes each application, and at the same time the patient should take two or three drops of liquor ferri iodidi, and a teaspoonful of cod liver oil, three or four times a day. If there be severe pains, the part should be frequently bathed in equal parts ef chloroform and tincture of aconite, and one or two teaspoonfuls of the neuralgia medicine given every day.

HYPERÆSTHESIA.

The character which these affections have in common, is exalted irritability, and increased irritation of the sensitive or centripetal nerves. The expression of this irritation is either physical, one of consciousness, a sensation,—or motor, a reflex movement,—or both at the same time.

The sensation varies according to the peculiar sphere of the affected nerve. Hyperæsthesia of the cutaneous nerves is manifested by pain in its various modifications; that of the nerves of special sense by phantasms. The part taken by the brain, as the

psychical organ in sensation, is not only receptive, but also reactive. If the imagination dwell upon the sensation, the latter becomes more intense and more defined; the power of imagination may create sensations, as proved by the feeling of nausea or prurigo, and a morbid condition termed hypochondriasis. Dreaming and insanity differ from unfettered consciousness, in their interpretation of centripetal action, by an absence or estrangement of self in the perception of sensations: evidence of this is presented to us in nightmare and hallucinations.

The second manifestation of exalted irritability of the centripetal nerve takes place by reflex action upon the motor apparatus; in which case sensation may be absent, or it may continue. In the former case, the absence of accompanying sensation increases the difficulty of forming a correct judgment; but we may satisfy ourselves of the real character of the affection by observing that the gentlest irritation of centripetal nerves, which in ordinary conditions would produce no effect, at once rouses reaction amounting to violent spasmodic effort, such as we see in poisoning by strychnin, in tetanus, or hydrophobia. The combination of sensation and reflex action, as often exhibited in hyperæsthesia, of the cerebro-spinal, and more particularly in the sympathetic system, allows of a more easy interpretation. Thus, in ciliary neuralgia, or photophobia, the eyelids are closed by reflex action, communicated by the sensitive fibres of the trigeminus to the motor fibres of the facial nerve. In sciatica, pain occurs in combination with cramps in the calves and spasmodic action of the leg. In the case of prosopalgia, with neuralgia of the tongue, reflex action was communicated to the hypoglossus, and in consequence of this the tongue was thrown about. Numerous instances present themselves, in connexion with hyperæsthesia of the sympathetic. Under this head I class disturbance of the rhythm of the heart's action from cardiac neuralgia, intestinal spasm, and ischuria accompanying mesenteric neuralgia. Nor is it only in the muscular tissue that hyperæsthesia is manifested by reflex action, the same is the case in other contractile tissues, but it is a subject to which hitherto little attention has been devoted. Thus, it may show itself in the skin; for it is not unusual for the hair in hemicrania to be elevated at certain painful parts. A farther relation between hyperæsthesia

and motor action is exhibited in the aura epileptica, phantasms, vertigo, and especially abnormal sensations of a current of air, or more frequently of tearing, dragging pains, which mount up from some point of the trunk or extremities to the head or adjoining parts, where they seem to be cut off, and are immediately followed by spasms. Epileptic attacks most frequently, and not unfrequently hysterical paroxysms, are introduced in this manner. Even tetanic and hydrophobic spasm occasionally commences with an aura at the seat of injury. In hyperæsthesia we find that not only the irritation is increased, but that also the irritability of the nerves of sensation generally is exalted, both during the paroxysms as well as in the intervals. During the paroxysms it shows itself by the extent of the sympathetic action, such as takes place, for instance, in the hyperæsthesia of the sympathetic nerve, and in hysterical affections. In the intervals it manifests itself partly by a derangement of sensibility, as in tenderness or numbness of the neuralgic parts, partly by the abnormal reaction to external stimuli, or to irritation proceeding from the organism. Thus, neuralgic patients exhibit an unusual sensitiveness to atmospheric influences of an electric or hygrometric character, whose approach they are thus able to foretell. Hugh Ley has made the observation that leech-bites induce erythema and ulcers in the skin of neuralgic subjects. I may also quote, in proof of my position, the trifling nature of the cause which occasionally gives rise to the paroxysms, and the contrast in the effects produced by these causes in different individuals. It is this exalted sensibility, upon which the change in the relations of the organism in hyperæsthesia depends, that distinguishes morbid processes from mere physiological activity of a stimulated nerve. Our acquaintance with these phenomena is not yet sufficiently extensive, but their study will be advanced by accurate observations of the free intervals occurring between the paroxysms.

If we turn from the physiological to the nosological features of hyperæsthesia, we observe that the following characters are applicable to the entire class:—1. Periodicity, the alternation of paroxysms and intermissions. 2. Uniformity and persistence of the symptoms, however long the duration of the disease. 3. Absence of danger to life. 4. Freedom of early life from the disease.

Hyperæsthesia of the Cutaneous Nerves.—The expression of this variety of hyperæsthesia consists in a sense of pain, itching, formication, and heat; pain is the most frequent symptom, and for this reason the term *neuralgia* has been used to designate it. These sensations come on in paroxysms, and are confined to the distribution of one or more cutaneous nerves,—of one, or occasionally of both sides of the body.

Injuries of the nerves may serve as types of this affection, because they may, as surgical operations generally, be looked upon in the light of experiments which afford a more distinct interpretation of simple conditions.

Neuralgia, from injury of a nerve, may be known by the pain commencing at a definite point in the course of a nerve, by its distribution to the peripheral terminations of the nerve, by excitement or exaltation of the pain by the slightest touch of the injured part, and by cessation of pain when compression is applied above the seat of injury. Sooner or later, sympathies in other nerves, not only in the vicinity, but also at a distance from the original seat, show themselves; and if the pain continue for a long time, a constitutional disease is developed.

Punctured wounds, cuts, bruises, and foreign bodies are the most frequent causes. The pain occurs in paroxysms, and is produced or increased by change of weather, affections of the mind, and errors in diet.

The purest form of neuralgia is seen when the injury affects very sensitive nerves, such as the subcutaneous nerves; becomes blended with symptoms of a motor character, or when those causes are seated in a nerve containing sensitive and motor fibres.

NEURALGIA.

Neuralgia Ischiatica.—The chief feature of this malady is pain in the distribution of the cutaneous branches of the sciatic nerves: it varies according to the seat and number of branches affected. If the posterior, middle, or lower cutaneous nerves, as often happens, be the seat of neuralgia, the posterior or lateral surface of the thigh is the suffering part, the pain extending to the popliteal space and the calf of the leg. The superficial branch of the calf of the pero-

neal nerve is less frequently affected: in this case the pain extends down the external and anterior surface of the leg, and along the external and inner half of the dorsal surface of the foot. The long cutaneous branch of the tibial nerve is more often involved, the pain then shows itself at the external malleolus and the outer edge of the foot. The plantar nerves are rarely affected, excepting the external tibial nerve, which supplies the heel.

The pain darts through these parts with the rapidity of lightning, up and down, cutting, tearing, and burning, with extreme violence, increased by slight contact, or gradually becoming permanent with a gouging or crushing character. At the same time the patient often complains of an oppressive, painful sensation in the vicinity of the tuberosity of the ischium, not far from the seat of the sciatic nerve, and of pains in the sacrum. At times the sciatic pain rivals that of facial neuralgia. Lentin mentions a patient in whom the ball of the right foot was the seat of pain; a slip of paper falling upon the ball, though covered with the stocking, excited the pain for several hours. The pain is most violent in plantar neuralgia, of which I have lately seen an instance in a woman of fifty-four years of age: her sufferings quite equalled those of tic douloureux. Hugh Ley quotes two similar cases; and Descot communicates one observed by Richerand, in which the application of the actual cautery to the sole of the foot proved effectual. The latest edition of Bell's works contains a case in which agonizing pains occurred in the sole of the foot, against which the most powerful remedies were of no avail. Bell examined the patient a few days before his death, and discovered a hard tumor in the popliteal space lying in the tibial nerve, and originating in external injury. In addition to the cutaneous pain, the patients frequently complain of other abdominal sensations, such as a sense of cold, heat, itching, horripilation, or cold affusion.

Sciatica occurs in paroxysms varying in duration, with a remittent, but rarely with an intermittent type. At the commencement of the disease they are more crowded together, later they are separated by longer intervals. The attacks occur towards evening, and at the beginning of night, with intermissions in the morning hours. There is frequently a persistent dull pain, or numbness, in the intervals, with tenderness on pressure, especially at those parts where

the skin immediately invests the bone, as at the knee, the head of the fibula, or the ankle.

Cervical and Intercostal Neuralgia.—The lower cervical nerves bear to neuralgia of the arm a similar relation to that existing between the upper, (especially the second and third, from which the occipital nerves branch off,) and neuralgia of the posterior surface of the head. The pain extends from the upper cervical vertebræ to the vertex, the external ear, and the mastoid process; occasionally it remains limited to a few small spots, but may be complicated with painful sensations in the face, or of the lower jaw, if the upper cutaneous nerves of the neck be affected. The pain occurs by jerks and starts, as in other neuralgic affections, both while the head is at rest and during its movements, which the patients avoid during the attack.

Ardor and Algor.—The perception of physical warmth is also conducted by the cutaneous nerves of sensation. This power does not, according to Bell's observation, appertain to the sensory nerves of the muscles; for when these are exposed in surgical operations, they exhibit sensitiveness on the application of hot or cold water, but are stated to be incapable of appreciating a change of temperature. It follows that ardor and algor occur as cutaneous hyperæsthesia; they are manifested by a sense of heat and cold, which does not correspond with the indications of the thermometer.

A common form is *ardor volatica fugax*. It is characterized by a hot flush passing over the forehead and chest, especially the face, and occasionally accompanied by the appearance of a thin perspiration. After a few minutes this phenomenon disappears as rapidly as it appeared. I have generally met with it in females about the climacteric period, and after the cessation of the catamenia. It is associated with mental excitement and great restlessness; and though it often obstinately resists all the remedies tried, it may, after a few years, yield of its own accord.

The chilliness accompanying the numbness of the limbs forms a contrast with the hyperæsthesia just spoken of, as well as of the sensation of cold confined to a small spot, algor circumscriptus. The individuals are almost always females, with an hysterical dia-

thesis. The symptom generally occurs on the scalp, and occasionally on the skin of the abdomen; it appears in paroxysms, and again vanishes, together with the other hysterical symptoms.

Vertigo.—The sensation of illusory movement generally attacks the individual suddenly, and without premonitory symptoms; consciousness is unaffected, and it is referred by him, either to himself or to surrounding objects. He feels as if he were going to fall, or were turning round, or as if every thing else were doing so.

This sensation is invariably preceded, accompanied, or followed by another symptom, the sensation of disturbed balance.

Those patients who complain of the illusory movement and the disturbed balance, prove by doing so, that their consciousness is unaffected; accordingly, the will continues to be active. They try to secure themselves against the abnormal sensation, which threatens to carry the body away with it, by means of movements which require some force for their execution, as by stretching out their arms, by planting the feet firmly, or by pressing the trunk against a support.

Among the *causes* of vertigo, the state of the blood occupies an important position, and we find that both an increase and diminution in the supply of blood, are followed by vertigo. Thus it commonly accompanies diseases of the heart, and especially hypertrophy of the left ventricle. On the one hand, we find vertigo induced by suppressed hemorrhoids, menstruation, epistaxis, or the omission of habitual extraction of blood; on the other, hemorrhages, whether undeveloped or intermittent, arthritis, or trichoma, pregnancy, and the pressure of tumors in the abdomen, are to be classed in this category. Not unfrequently the affection is caused by injury and diseases of the brain, and especially of the cerebellum, or by epilepsy, for the paroxysms of which, vertigo is not unfrequently substituted.

Hyperæsthesia of the Optic Nerve. — Hyperæsthesia of the optic nerve, is manifested by luminous and chromatic sensations. It is usually preceded by headache, a sense of tension in the eyes, loss of appetite, and general debility. It generally runs a chronic course, and is usually produced by congestion of the brain, optic nerve, and structure of the eye.

Acoustic Hyperæsthesia.—Increased sensibility of the auditory nerve, is characterized by tinnitus aurium, melodious chants, or noises resembling the human voice, or the cries of animals. These sensations of sound occur whether the ear be open or closed. This affection of the nerve may be produced by violent explosions, continued loud noises, diseases of the brain, and inflammation of the nerve.

Olfactory Hyperæsthesia is recognised by an increased sense of smell.

Gustatory Hyperæsthesia, is an increased sensibility of the nerves of taste.

Hyperæsthesia of the Cardiac Plexus is recognized as Angina Pectoris, which is described in another portion of the work.

Hyperæsthesia of the Solar Plexus is recognized by violent, contracting pains, at the pit of the stomach. It is usually preceded by a sense of oppression. The hands and feet are cold, and the pulse feeble. The stomach is usually distended, and tender on pressure. It occurs in paroxysms, and lasts only a few minutes.

Bilious Colic, or Hyperæsthesia of the Mesenteric Plexus.—Hyperæsthesia of the mesenteric plexus is characterized by sharp, twisting pain, extending from the umbilicus to the lower portion of the abdomen. It occurs in paroxysms, and is of a most excruciating character. The patient is restless, hands, feet, and cheeks are cold, and the pulse is small and hard. The abdomen is tense and distended; obstinate constipation, and usually nausea and vomiting occur. The fits usually last from a few minutes to several hours. This disease is generally recognized as colic; and when connected with vomiting of bilious matter, has been denominated bilious colic, and has been mistaken for inflammation of the bowels. It is a pure neuralgic affection, and amenable to the same treatment as hyperæsthesia in other parts of the body.

Hyperæsthesia of the spermatic plexus, and other nerve ganglia, and sections or portions of the nervous system may occur. In short, all portions of the nervous system, including the brain, spine, and entire sensitive nervous system, may become subject to hyperæsthesia, or increased nervous sensibility; and, when attacked with this disease, manifest the same general symptoms. All the forms of hyperæsthesia, including the complicated varieties of neu-

ralgia, may be distinguished from inflammatory diseases by their peculiar periodicity, and the systematic order in which the paroxysms of pain are repeated.

Causes of Hyperæsthesia.—Hyperæsthesia may be produced by specific poisons introduced into the blood; such as lead, mercury, arsenic, and other poisonous minerals: it may also be produced by scrofulous or tuberculous diseases, by a debilitated state of the fluids, by local irritants, long-continued nervous excitement, zymotic and vegetable miasms, together with other agents which irritate, debilitate, and exhaust the nervous system.

Treatment.—The treatment of hyperæsthesia may be divided into palliative and radical. The palliative treatment consists in the administration of anæsthetics, such as chloroform, sulphuric ether, aconitin, hyosciamin, cypripedin, belladonna, cannabis indica, cannabis sativa, opium, morphine, lupulin, cicuta, etc. These remedies may be applied either locally, or taken internally. When taken into the stomach, they reach the nerves through the medium of the blood; when applied externally, they may come directly in contact with the nervous tissue. In either case their influence is the same. Among the most potent anæsthetic agents, are chloroform, sulphuric ether, aconitin, and the opiates. A most valuable anæsthetic for external applications, in case of active neuralgia, is the following: Take chloroform, two fluidounces; aconitin, two grains; sulphate of morphine, ten grains. Mix, and apply to the part by means of a little lint, or a small pad of cotton. Another very valuable preparation is to take ten grains of aconitin, and ten of the extract of belladonna. Form an ointment with one dram of lard. Let this be applied to the affected part with friction. Where the neuralgia is connected with tumors or external injuries, the tumor should be removed either by a surgical operation, or by proper medication. Wounds and injuries should also receive proper treatment. The internal remedies or constitutional treatment, will depend somewhat upon the condition of the patient, and the locality of the disease. If confined to the mesenteric plexus, as is the case in bilious colic, the treatment should be commenced by an active lobelia emetic, and the application of some of the anæsthetic mixtures, followed by hot packs. As soon as the emetic has operated, ten grains of dioscorin

and one of gelsemin, should be triturated in one dram of sugar, divided into ten powders, and one given every half hour, followed by a large draught of as hot water as the patient can drink. As soon as the active character of the paroxysms has been controlled by the hot packs, gelsemin and dioscorin, one drop of prussic acid, and two or three grains of sulphate of quinine, should be given every hour, until eight or ten doses have been taken. In no case should purgatives be given, until all symptoms of the neuralgia have disappeared, as it is by these agents so much mischief is done. Hot water injections may be given frequently during the treatment. In obstinate cases it will be necessary to repeat the emetic, and follow it by a rum sweat. Where there are inflammatory symptoms, aconite may be given to control them; baths will also assist in controlling the paroxysms, and, where it is required, much larger doses of dioscorin and gelsemin may be given. In other forms of neuralgia, after the stomach and bowels have been effectually cleansed, one teaspoonful of the neuralgia mixture, given every two or three hours, and continued, will usually effect a cure. Where neuralgia is caused by a debilitated constitution, cod liver oil, strychnin, iron, valerian, ammonia, scutellarin, lactuca, sativa, ignatia, Indian hemp, leonurus cardiaca, phosphorus, and iodide of ammonia and potassium, in connection with cod liver oil, should be given in such combinations as the case may indicate. Mineral acids and lupulin are also used to advantage in these affections. Out-door exercise, baths, and a good diet, must also be prescribed.

ANÆSTHESIA.

By anæsthesia is understood loss of the energy of the sensory nerves.

Anæsthesia of the Cutaneous Nerves. — The characteristic symptom of this variety of anæsthesia, is diminution or loss of the normal sense of the skin, in its simple or modified condition. Cutaneous anæsthesia gives rise to diminution, or a loss of the sense of warmth and cold, as well as of tactile sensation. English physicians have published a few accurate observations on the change of the sense of temperature in anæsthesia. In one case, in which anæsthesia had affected the feet half up the calves and the hands,

the patient experienced no perception of temperature when brought into contact with solid bodies, not even if ice were applied; water, at every temperature, appeared lukewarm. Another patient, himself a physician, (Dr. Vieusseux, of Geneva,) whose right side was anæsthetic, called hot things that were applied to it, cold or lukewarm, and cold things hot. When lying in a cold bed, it seemed hot to the right side, and cold to the left. In a hot bath the water appeared hot to the left side, and neither hot nor cold to the right. Very cold water produced a sense of warmth to the right side. If he touched a substance which was neither hard nor polished, such as the hand of a friend, he was unable to determine its temperature, and he was forced to call in the aid of the left hand.

Anæsthesia of the Nerves of Special Sense.—*Amaurosis*, (Gutta Serena.)—The individual affected with it sees objects indistinctly, even when they are lighted up by a bright light: they appear surrounded by a fog or mist, and no effort nor the employment of artificial means, increases the distinctness. The outlines of objects appear not only indistinct, but also broken, and thus disfigured. The flame of the candle appears rent; while reading, the patient misses single syllables, words and lines, and he is forced to follow them by moving his eye, his head, or his entire body. At times the upper or lower, the right or left half, the circumference or centre of the object only is seen; at others the loss of vision is still more partial, and is confined to different spots of small extent, and with differently shaped outlines. Instances also occur in which the object only is seen, when it bears a definite relation to the eye, and it vanishes on the slightest movement of the eye or head. The faculty of distinguishing color is often lost.

When the disease is at this stage, it is termed *amblyopia;* when vision is entirely lost, it is called *amaurosis.*

An attack of amaurosis is often preceded by phenomena of optic hyperæsthesia, (photopsia, chromatopsia,) which, in many cases, accompanies the disease when completely developed.

Among the causes predisposing to optical anæsthesia, we have to enumerate hereditary taint, the middle period of life, and masturbation, in the female sex the climacteric, and the development of pigment; amaurosis is rare in gray and blue eyes, as compared with

the liability of dark irides. Among the specific substances which suppress the activity both of the ciliary and the optic nerves, I must mention belladonna and hyoscyamus. Lead poisoning, especially by an atmosphere filled with lead dust, occasionally gives rise to amaurosis, either in combination with other nervous affections, that precede or are associated with it, such as colic or saturnine epilepsy, or, though rarely, by itself. It generally supervenes suddenly, runs a rapid course, lasting only a few hours, or days, or during life.

Acoustic Anæsthesia.—This anæsthesia may be defined as the absence or loss of the power of the acoustic nerve to perceive impulses of solid bodies, or vibrations of the air, as sound, owing to a diminution or loss of the conducting power, or excitability of the acoustic nerve.

In acoustic anæsthesia, the loss of hearing generally commences in one ear, gradually and almost imperceptibly: it rarely affects both organs at the same time. At first, distant sounds only are indistinctly perceived. There is a difficulty in following a general and animated conversation, the sounds becoming confused. After a time the opposite ear suffers, and the deafness increases. Sooner or later tinnitus aurium supervenes. It is at first indistinct; but as the disease increases, becomes loud and sonorous. This noise not unfrequently extends from the ear to the entire head. Certain circumstances exert an undoubted influence upon the improvement or increase of the affection. It is augmented by mental fatigue, depressing emotions, by damp, stormy, or cold weather, or debilitating discharges; while light-heartedness, a hopeful frame of mind, and a dry, mild atmosphere, relieve the patient, though but temporarily. The same applies to loud noises in the vicinity, driving in a rattling carriage, the ringing of a bell, the beating of a drum, etc. Anæsthesia of the acoustic nerve either remains permanently at this stage, or complete deafness ensues, to such an extent that hearing can no longer be excited by any stimulant. In this case the tinnitus generally ceases.

The causes of deafness must be divided in to such as destroy the conducting power of the peripheral, or of the centric tract of the auditory nerve. Among the former we must enumerate sudden,

violent concussions of the acoustic nerve, by loud explosions, thunder, etc., or by concussion of the cranial bones, or by a vigorous box on the ear, injury or laceration accompanying fractures of the cranium, compression by tumors seated in the petrous bone, and at the base of the brain. Among the central causes, disorganization of the brain is the most frequent, whether idiopathic, or resulting from destruction of the petrous bone by osseous tubercle. In the cases that have hitherto been placed on record, the cerebellum, though not exclusively affected, has generally been found to be the seat of the disease.

ANÆSTHESIA GUSTATORIA, (AGEUSTIA.)

What I include under the above term is the loss of taste, owing to the conducting power of the nerve of taste having been destroyed. This distinguishes the affection from an impairment of the sense of taste, resulting from conditions which prevent the action of a rapid substance upon the nerves, as dryness of the tongue.

Treatment.—The general treatment in anæsthetic diseases consists in removing the cause or causes of the difficulty, so far as practicable, in toning and invigorating the system generally, and in the use of anti-anæsthetic agents. Among the most reliable anti-anæsthetic remedies, are nux vomica and its preparations, ignatia, viburnin, and rhus radicans. In cases of anæsthesia of the optic nerve, I have found the following prescription most valuable:—Take viburnin, ten grains; iron by hydrogen, twenty grains; sacch. alba, one dram: mix. Make twelve powders. Dose, one every two hours. At the same time let the patient take from three to five drops of the acetic tincture of rhus radicans, four or five times a day. During the interval between the administration of these remedies, hydrastin, iron, and quinine, with cod liver oil, should be given for the purpose of invigorating the general system. In hyperæsthesia of the auditory nerve, nux vomica frequently serves the most valuable purpose. The following prescription may be used:—Take essential tincture of nux vomica, one dram; ferri hypo-phosphite, two drams; syrupus simplex, six ounces. mix. Dose, one teaspoonful three or four times a day. The ear should be frequently syringed with warm water, for the purpose of removing all foreign

substances, dry wax, etc.; and the peripheral nerves may be stimulated by rubbing around the ear with liniment, composed of the equal parts of myrrh, capsicum, and nux vomica. In some cases of anæsthesia, much benefit may be derived from dry friction, or a gentle current of electricity. The constitutional treatment should be such as would produce a normal condition of the emunctories generally.

Neuroses, of Mobility.—A Neurosis of Mobility is that vital process in which the activity of the centrifugal nerve, owing to a change in its excitability, deviates from the normal condition.

The activity of the centrifugal (motor) nerve, is manifested by the contraction of the muscular fibres supplied by it; and this manifestation, when abnormal, may be exalted, or depressed, and extinguished. In the former case we have to do with *hypercinesis;* in the latter, *acinesis.*

Consequently, there are two organic elements, the motor nerve, and the contractile fibre, whose mutual action is necessary, and to both of which we must pay special attention. The integrity of the muscular fibre is an essential condition of contraction; the nerve loses all power as soon as the muscular tissue has undergone alteration, though only of a microscopic character: the contractile tissue and the inner coat of the vessels, though dependent upon nervous stimulation, play a subordinate part in the theory of these neuroses.

The antagonism, the balance, and the co-ordination of movements depend upon this. The unsymmetrical, but harmonious movements of seeing eyes afford a proof that, notwithstanding the existence of symmetrical nerves and muscles, the movements are guided by an equilibrium dependent upon sensorial impressions.

HYPERCINESIS, OR SPASMS.

The character common to this class of affections is, exalted irritability, and increased action of the motor nerve.

This activity is evidenced by muscular contraction occurring with quick changes, or enduring, as clonic or tonic spasm; the latter does not, however, originate in a persistent influence exerted upon the motor nerves, but as Edward Weber's experiments with

the rotary apparatus have shown, in a succession of shocks communicated to the motor nerves. He states, that if the galvanic shocks communicated to a muscle or its nerve, be repeated so rapidly that the contractions which ensue, in spite of their short duration, follow one another in such immediate succession, that the succeeding one commences before the preceding one has ceased, the contraction of the muscles becomes persistent, and so perfectly continuous, that even with the microscope we are unable to perceive the movements and tremors of individual muscular fibres.

The muscles of animal life, which are under the dominion of the cerebro-spinal nerves, and the muscles of organic life which are controlled by the sympathetic system, exhibit the peculiar type of their movements in the spasmodic contractions not less than in the healthy movements; and in the former we see a muscular fibre at the same time uniformly and continuously contracted throughout its extent, while in the latter we find successive contractions in wave-like progression. Although, however, the fundamental type is preserved, we meet with deviations in duration and locality; in spasmodic action of the heart the ventricles contract several times before a contraction of the auricles takes place, and the rhythm of the contraction itself is irregular.

The cycle of spasmodic labor-pain is different from that occurring in normal labor; the pain attains its climax suddenly, at which it remains for a considerable time, and then subsides quickly. The contraction of the uterus is effected partially and irregularly. In intestinal spasms the waves of the movement very often recede, and cause anteperistaltic action. The organs possessed of a sphincter are not unfrequently attacked with spasms, in which the normal antagonism to their contractions is removed: thus, we find a desire to micturate in connection with ischuria, and tenesmus associated with a desire for defecation.

Causes.—Spasms resulting first, from irritation of the motor nerves, as conductors. Secondly, spasms from irritation of the central organs, the sympathetic ganglia and plexuses, the spinal cord and the brain.

We possess but few observations on the alterations occurring in muscles in consequence of spasm. Bowman is the first who has

investigated the subject accurately. He found some muscles in tetanus perfectly healthy, while others presented a peculiar pale-gray appearance in many parts, like the flesh of fish, doubtless owing to the blood having been squeezed out of the vessels. In other parts, again, they had almost lost their fine filamentous structure, and presented a soft, spotted mass, which easily tore, or retained the print of the finger. Extensive ecchymoses were frequently met with, which contrasted with the pallor of adjoining parts.

Spasm in the Range of the Motor Nerves of the Inferior Extremities.—The seat and cause of the affection induce various modifications in the phenomena accompanying it.

Among the muscular nerves of the thigh, the branches of the first and second lumbar nerves, which are distributed to the flexors, the psoas and iliacus, are the more frequent seat of the spasm, and cause the spasmodic contraction of the hip, the diagnosis of which disease has been determined by Stromeyer's investigation. The extremity is bent at the hip joint, and is incapable of being extended. Attempts at extension excite violent pains in the knee. The tendons of the psoas and iliacus, and the muscles themselves, project in dense ridges: touching them increases the pain in the knee. The hip is drawn up by the action of the quadratus lumborum and the abdominal muscles, so as to induce an apparent shortening of the extremity, from the tip to the affected foot, only touching the ground in walking.

Treatment.—The treatment of spasms may be divided into radical and palliative. The radical treatment consists in ascertaining the cause, and introducing such general or local treatment as to remove it. The palliative treatment consists in the administration of anti-spasmodics, among the most reliable of which we find the following:—Gelsemin, lobelia, valerian, castor, scutellarin, cypripedin, musk, veratrum viride, and camphor. To relieve the spasms, these remedies may be given either alone, or in such combinations as the nature and circumstances of the case may indicate. The spasms of children may be relieved by an injection of the tincture of lobelia, and a warm bath. In adults, where it can be accom-

plished, gelsemin and lobelia should be introduced into the stomach. In cases of permanent hypercinesis, as epilepsy and chorea, they should be treated as directed under the head of those diseases.

HICCOUGH, OR SINGULTUS.

Hiccough consists in a spasmodic contraction of the diaphragm, and a certain degree of constriction of the glottis, which arrests the air in the trachea; thus producing sudden, short, convulsive inspirations, attended with a slight laryngeal sound, and followed immediately by expiration.

It is usually the result of some derangement remote from its apparent seat, and is, therefore, strictly speaking, merely a symptom. The young and the old are more frequently affected than those of middle age. The intemperate, and hysterical and pregnant women, are subject to it. Among its exciting causes are over-distention of the stomach, indigestible food, draughts of cold water, flatulency, excessive use of alcoholic drinks, the passage of urinary or biliary calculi, retrocession of cutaneous affections, suppression of accustomed discharges, and low forms of fever and inflammatory diseases.

Treatment.—When hiccough occurs as the result of nervous affections, suddenly attracting the mind will frequently cure it. When dependent upon a disordered condition of the stomach, an emetic will relieve it; and when produced by flatulency, a large draught of cold water will prevent it. In case of great debility, stimulants will be required.

LARYNGISMUS STRIDULUS, OR SPASMODIC CROUP.

Laryngismus stridulus, crowing disease, or spurious croup, is an infantile spasmodic affection, occurring usually during dentition, characterized by intervals of suspended respiration, difficult breathing, and crowing inspiration, followed in many instances by convulsions, resulting from a temporary closure of the chink of *rima glottidis*, by which the entrance of air into the lungs is impeded or stopped.

Symptoms.—An attack of laryngismus stridulus is sudden, occurring usually during sleep, from which the child is awakened by

great dyspnœa and hurried respiration. The countenance is bluish or livid, the eyes staring, the veins of the head and neck distended, and each inspiration is attended with a crowing sound. When there is a complete closure of the rima glottidis, respiration is entirely suspended. The child makes vehement struggles to recover his breath. At varied intervals, from a few seconds to a minute, the rima glottidis somewhat relaxes, and the air rushes in with a peculiar shrill, whooping sound. These symptoms are usually succeeded by fits of coughing or crying, and after a short period of hurried respiration, he recovers his usual health. If, however, the rima glottidis remains closed more than three minutes at the utmost, the child dies from suffocation.

Occasionally, in connection with the above symptoms, there is a spasmodic contraction of the flexor muscles of the thumb, fingers, wrist, ankle, and toes, giving to the foot a club-foot appearance. These paroxysms may return in a few hours, or not for several weeks.

This complaint is unattended with fever, cough, bronchial difficulty, or inflammation of the larynx or trachea, by which it is readily distinguished from genuine croup.

The glottis is occasionally spasmodically affected in *adults*, in which the same phenomena peculiar to children occur to a certain extent.

Cause.—False croup depends upon a general morbid excitability of the nervous system, the muscles of the glottis being chiefly affected. The sudden contact of cold air, vivid mental emotions, as fright or anger, or any quick unexpected movement, may cause a spasmodic contraction of these muscles. Dentition, impure air, unwholesome food and disorders of the alimentary canal, are capable of producing an attack. It in some instances is associated with a diseased state of the brain. It has also been ascribed to inflammation of the spinal marrow, and to tumors pressing on the par vagum, or the recurrent laryngeal nerve, which regulates the movements of the glottis. It has been supposed to consist of an enlargement of the thymus gland; hence it has been styled *thymic asthma*. The glands of the neck pressing on the pneumogastric nerves, may also be mentioned as a cause of spurious croup.

Treatment.—The only treatment required in this form of the disease, is some anti-spasmodic. It may be distinguished from the

pseudo-membranous variety by its sudden appearance at night, when the child was apparently well during the day, and by its almost as sudden disappearance on the administration of a few drops of tincture of lobelia, and the application of a wet pack to the neck.

When it is associated with any other disease, the cause should be removed.

HOOPING COUGH, OR PERTUSSIS.

Hooping cough, or pertussis, is characterized by a severe convulsive cough, occurring in paroxysms, and consisting of several respirations, accompanied by a sonorous whooping inspiration. It is of an infectious character, occurring principally among children, and rarely attacking them the second time.

Various opinions have been held respecting the seat and nature of this disease. It is probable, however, that it is dependent upon some morbid influence exercised upon the pneumogastric nerve. One of its most common causes is epidemical influence.

Symptoms.—The phenomena characteristic of pertussis are at first those of a common cold, as coryza, redness and suffusion of the eyes, sneezing, slight hoarseness, irritation of throat, a dry cough, lassitude, headache, difficult breathing, and some febrile excitement. The sleep becomes disturbed, the appetite impaired, and the bowels torpid. After the catarrhal stage has continued about ten days, the cough assumes a peculiar shrill sound or whoop. The child is seized with an irresistible disposition to cough, which occurs paroxysmally, in which a number of the expiratory motions characteristic of coughing, are made with an almost convulsive force and rapidity, without any intervening inspirations. This spasmodic coughing is powerful, and expels the air so largely from the lungs, that the patient turns black in the face, and seems about to be suffocated, until one long, protracted act of inspiration ensues, by which the air rushes through the contracted glottis, causing the characteristic whooping sound. This succession of a number of expiratory coughs, with one shrill inspiration, continuing from one to fifteen minutes, is repeated again and again, until an expectoration of a viscid mucus, or vomiting takes place. These paroxysms

may recur two or three times a day, or as often in one hour. Their approach is preceded by a feeling of tightness in the breast, titillation in the larynx, and increased frequency of the pulse and respiration, and the patient appears to dread its approach, and represses the cough as long as possible. During the urgency of this spasmodic coughing, the face is flushed, swollen, and sometimes purplish, or livid, the eyes start, the veins of the neck and temples are distended, the countenance indicative of much distress, the little patient frequently stamps with impatience, and clings to his nurse for support, or whatever object may be near him. As soon as expectoration and vomiting ensue, the paroxysm is over. The child may pant and appear fatigued for a short time, but generally there is complete relief. The nocturnal paroxysms are more severe than those occurring during the day. When the disease is uncomplicated, the child appears quite well during the intermission. In the earlier paroxysms, the expectoration is thin and scanty, and in proportion as this is the case, the fits are the longer and more violent.

In violent cases, blood may escape from the nose, mouth, or ears, or be extravasated into the conjunctiva.

The series of coughs frequently occur a long time before the shrill inspiration is heard, which in some cases seldom occurs throughout the disease.

The duration of hooping-cough is variable; some cases being cured in about two or three weeks, while others continue troublesome for several months. Dr. G. D. Gibbs states, that the urine is saccharine, *pertussal glucosuria;* the quantity of glucose or sugar being usually small, and often consisting of a mere trace. Small ulcers on the frænum of the tongue sometimes occur, which are ascribed by Dr. Gamberini to the frequent impinging of the part against the teeth, in the paroxysms of coughing.

Fatal convulsions are sometimes produced by effusions into the brain, and death may result from asphyxia. In protracted cases, the patient may die of exhaustion. These results are, however, rare, as the disease, when uncomplicated, usually terminates favorably.

Hooping-cough may, however, be complicated with bronchitis,

pneumonia, remittent fever, convulsions, croup, intestinal inflammation, or some cerebral disease. If there be a predisposition to the existence of tubercles, they are apt to be developed during the progress of hooping-cough.

Anatomical Characters.—The appearances revealed upon dissection are, according to Dr. Graily Hewitt, a viscid, muco-purulent fluid in the bronchi, patches of collapsed lung, and dilatation of the air-cells in the neighboring parts. He also observed minute abscesses at the termination of the bronchi, hepatization, and pneumonic and pleuritic adhesions. There may be marks of cerebral congestion, and various other morbid appearances; the result of the complications associated with the disease.

Treatment.—Hooping-cough, as we have previously stated, is a hyperæsthesia of the pneumogastric nerve, produced by a materies morbi in the blood of a specific character; and although we are unacquainted with the chemical or physical nature of this miasm, yet it is reasonable to infer that it is of a parasitical character. We infer this from recent experiments made with disinfectants, which are known to exterminate nearly all forms of parasitical growths. Thus, hooping-cough, in its incipiency, may be cured by inhaling a diluted vapor of sulphurous acid; which can be effected by adding one dram of the acid to four ounces of water, converting it by heat into a vapor, and allowing the patient to inhale it. We have completely disinfected the blood, and eradicated the disease by two or three inhalations of half an hour each. After the disease becomes seated, the following treatment, in connection with daily vapor inhalations, should be instituted:—Take of oil of skunk cabbage berries, from one to three drops, four or five times a day. Or, take pulverized alum, twenty grains; cochineal, ten grains; syrup of stillingia, one pint and a half. Mix, and give one-half teaspoonful three or four times a day. Or, take triturated belladonna, thirty grains; triturated sanguinarin, twenty grains; triturated eupatorin, twenty grains. Mix, divide into fifteen powders, and give one three times a day. Once in five or six days, give from ten to fifteen grains of sulphate of cinchonin, divided into six parts, and taken at intervals of three hours. In case the above should not relieve the patient, the neuralgic mixture should be used, in connection with cod liver oil and iron.

COLIC.

Colic is characterized by severe twisting pains in the bowels, occurring paroxysmally.

Bilious Colic.—*Symptoms.*—It commences with very acute pain about the region of the navel. The patient complains of great thirst, and is generally costive. He vomits a hot, bitter, and mostly a yellow bile, which at first seems to afford some relief, but is quickly followed by the same pain as before. As the disease advances, there is an increased propensity to vomit, which becomes almost continual. The natural motion of the intestines is so far inverted as to render an evacuation almost impossible. If the patient be young and plethoric, the pulse will be hard and resisting, the surface will be covered with a cold, clammy sweat during the paroxysm of pain. The vomiting will also prove very persistent.

This disease may be distinguished from inflammation of the bowels by pressure upon the abdomen, which in bilious colic always affords relief; but, on the contrary, in inflammation of the bowels it increases the pain and aggravates all the symptoms. (See Hyperæsthesia of the Mesenteric Plexus.)

Flatulent Colic.—Flatulent colic, arising from an accumulation of air in the alimentary canal, is characterized by paroxysmal pains in the bowels, unaccompanied with inflammation. It attacks persons whose stomachs or intestines are debilitated. Cucumbers, fresh warm bread, unripe fruit, etc., produce the disease in those who are constitutionally predisposed.

Symptoms.—A sense of distention and uneasiness in the pit of the stomach is soon followed by excruciating abdominal pains. The pain may be confined to the umbilical region, or extend over the entire abdomen. During the paroxysms of pain, the patient is apt to move to and fro, with his body bent forwards, and the hands tightly pressed against the stomach.

The pain is somewhat mitigated when eructations of wind occur, as is the case when the stomach is the seat. In some instances the muscles of the abdomen are contracted, while in others tympanitis attends the colic. Usually the bowels are constipated, the pulse is natural, und the tongue clean.

Diagnosis.—Flatulent colic is distinguished from the bilious form by the absence of bilious symptoms. It may be distinguished from strangulated hernia by a careful examination of the abdomen, in connection with other symptoms which present themselves. From gastro-intestinal inflammation and the peritonitis, it is sufficiently characterized by the absence of fever, the irregularity of the pain, its relief by pressure, and the motions of the patient.

Prognosis.—The prognosis of flatulent colic is usually favorable, excepting in protracted or obstinate cases, in which the muscular intestinal coat becomes so paralyzed as to produce constipation of the bowels.

Treatment.—Take essence of peppermint and tincture of gelseminum, equal parts. Let one or two drops be taken in two or three ounces of hot ginger tea every ten or fifteen minutes. This will usualy afford relief. When it fails, however, hot packs should be applied to the abdomen, and injections of hot water administered, containing a dram or two of the essence of anise. Warm aromatic teas, such as coriander, caraway, and fennel seed, will also be beneficial. After the paroxysm is relieved, the cause should be sought for and removed.

LEAD COLIC.—Lead Colic, or Colica Pictonum, is characterized by an intense grinding or twisting sensation around the navel, retraction of the abdominal integuments, pain in the back, languor, pallor, vomiting, general debility, and the existence of a blue or slate-gray line around the edges of the gums. Paralysis of the muscles of the arms sometimes results from lead colic, causing *drop-wrist.*

Sleeping in a recently-painted room, drinking fluids which have been kept in leaden vessels, etc., are frequent causes.

Treatment.—Take sulphuric acid, thirty drops; pure water, one ounce. Give from ten to twenty drops, five or six times a day, for several days. During the treatment, a lobelia emetic, vapor baths, and mild purgatives should be given. When the active stage of the disease has passed, vegetable tonics, wine, porter, and a nutritious diet, are all that will be required to restore the patient to health.

COPPER COLIC.—This form is also liable to occur when the patient has been exposed to the metal, either by inhalation or other-

wise. The symptoms are similar to those of lead colic. In addition to the constitutional treatment required to control the paroxysms, albumen, or the white of eggs, and the ferricyanide of potassium, should be given to neutralize the poison.

EPILEPSY.

Epilepsy is characterized by a sudden loss of consciousness and sensibility, accompanied with spasms and convulsions occurring paroxysmally. An attack may come on suddenly, without any premonitory symptoms. Usually, however, headache, nausea, giddiness, dimness of vision, tinnitus aurium, spectral illusions, distention of the veins of the neck, defective articulation, temporary deafness, drowsiness, and the peculiar sensation known as the *aura epileptica*, precede the occurrence of the paroxysms. As soon as the latter symptom ceases, the paroxysm occurs. The seizure is characterized by a cadaverous pallor of the countenance, and the utterance of a loud, piercing shriek, or scream, immediately after which the individual falls to the ground senseless, and violently convulsed. During the attack the convulsive movements continue violent. There are gnashing of the teeth, foaming at the mouth; the tongue is thrust forward, and often severely bitten; eyes are partially closed and suffused, eyeballs rolling, the pupils insensible to light, skin generally cold and clammy, the breathing laborious, or almost suspended, the face flushed and turgid, and there may be involuntary defecation, vomiting, with palpitation of the heart. In fact, death seems about to take place from suffocation; when gradually these symptoms subside, the extremities of one side are jerked about, and shortly afterwards all convulsive movements cease; the respiration becomes full and more regular, the countenance more composed, and the patient finally falls into a state of stupor, or deep sleep, from which he recovers, exhausted, and with a headache, but without any knowledge of the paroxysm. During the somnolent state, the patient generally perspires freely, especially about the head, neck, and breast. The average duration of the attack is about five or eight minutes; it may, however, last for half an hour, or more. The periods at which they recur are variable. At first there is often a respite for three or four months; but as the disease progresses, the intervals become shorter, until hardly a day passes

without their occurrence. The countenance of the epileptic generally exhibits a more or less vacant or stupid expression; the muscles appear in a sort of fixed state, the eyes are dull and wandering, and the pupil sluggish or dilated. There is a general torpid condition of the system, with a tendency to frequent headache.

Causes.—The tendency to epilepsy is frequently inherited. Malformations of the head are frequent predisposing causes. Among its exciting causes may be mentioned difficult dentition, fright, blows upon the head, indigestion, intestinal worms, amenorrhœa, retrocession of cutaneous affections, use of tobacco and alcoholic stimulation, debauchery of all kinds, masturbation, biliary and urinary calculi, atmospheric vicissitudes, and, in fact, any cause capable of producing irritability of the nervous system, and a determination of blood to the brain, and especially the cerebellum. It is more common at the date of puberty than at any other period, and is usually accompanied with some derangement of the catamenia. Associated with epilepsy we frequently observe dyspepsia, constipation, insomnia, depression of spirits, nervousness, leucorrhœa, involuntary seminal discharges, etc.

Anatomical Characters.—If death occur during a paroxysm, the brain is found more or less congested. In cases of long standing disease of the cerebral blood vessels, softening, or induration of the brain, and increase of its weight, may be observed. Occasionally the bones of the skull are thickened or otherwise diseased.

Pathology.—The cause of epilepsy consists first, in an exalted sensibility and excitability of the medulla oblongata, rendering this part liable to discharge its force in involuntary reflex movements, upon any exciting occasion. When the disease is of long duration, organic vascular dilatation occurs in the medulla, too much blood is supplied, and the ganglionic groups are too strongly irritated. Consequently increased exudation of albumen ensues, the coats of the organs are thickened, the medulla becomes hardened, and we have fatty degeneration, softening, etc.

Treatment.—There is perhaps no disease where a greater diversity of medical treatment has been instituted than in epilepsy. Among the remedies that have been advanced as specifics are iodide of potassium, iodide of ammonia, bromide of potassium, and ammonia, permanganate of potash, digitalis, stramonium, conium,

maculatum, belladonna, cannabus indica, ignatia, strychnin, prussic acid, quinine, and euphrasia. Each of the above, and many other remedies, have occasionally cured this disease, while in other cases all have failed. My colleague, Prof. Jas. McClintock, has cured several cases, associated with disease of the brain, by trephining. Dr. Watson thinks the oil of turpentine is a most effectual remedy. Dr. Todd recommends the vapor of chloroform; and Dr. Chapman, the application of ice; Dr. Brown Sequard cauterizes the back of the neck by means of a hot iron; Dr. Tanner speaks highly of a compound of camphor, valerian, asafœtida, naphtha, and oil of cajeput.

In the treatment of epilepsy, as in other diseases, the cause should be sought for, and, if possible, removed. When it originates from difficult dentition, the system should be supported with cod liver oil, iron, and other tonics. When arising from worms, they should be removed by proper remedies. If connected with derangement of the catamenia, masturbation, or spermatorrhœa, the appropriate treatment should be instituted. During the paroxysms, the inhalation of ether or chloroform, the application of ice to the head, heat to the extremities, and fresh air, will frequently cut them short. The diet should be well regulated, and the stomach occasionally cleansed by a lobelia emetic, and the bowels kept free by means of mild laxatives or purges. If, after the cause is removed, and the system well regulated, the paroxysms should continue, the following intermittent and anti-periodic treatment should be tried:—Take tincture of gelsiminum sempervirens, one dram; tincture of datura stramonium, one-half dram; tincture of lobelia inflata, two drams; hydrocyanic acid, one dram. Mix, and let the patient take from two to five drops every two or three hours for five or six consecutive days. Then give the following:—Take sulphate of quinine, thirty grains; prussiate of iron, one dram. Mix, and make fifteen powders. Let one be given every two or three hours. This should be followed by sufficient magnesia to act as a purge. This course of treatment may be repeated, and continued for several months. I have known some obstinate cases cured by this method. When this fails, five or ten grains of bromide of potassium, and one or two of bromide of ammonia, may be administered three or four times a day, for

fifteen or twenty days. I have also known of a few cases being cured by the following compound:—Take fluid extract of lobelia, cypridium, and scutellaria, equal parts. Mix; dose, half a dram three or four times a day. Prof. Oldshue relates several cases which he cured by making a decoction of digitalis purpurea, by adding two ounces of the fresh leaves to one quart of water, and administering one tablespoonful every two or three hours, until the toxic impression of the drug was manifested. I once cured a confirmed case of epilepsy by removing a tape-worm with the pumpkin seed treatment. I have also cured several cases by administering a gill of a strong decoction of euphrasia officinalis four or five times a day, for two or three weeks. Brown Sequard highly recommends small doses of nux vomica. Dr. Hemple recommends hydrocyanic acid, nitrate of silver, phosphorus, sulphate of zinc, oxide of zinc, arsenic, quinine, and mercury, to be given homœopathically. In case of injuries of the brain, trephining, as recommended by Prof. McClintock, may be resorted to; and when associated with a strumous habit, cod liver oil, iron, and general tonics administered. Douches to the head, out-door exercise, and general bathing, in connection with lively sports, will also aid in the treatment.

HYSTERIA.

This is a disease of the nervous system, and almost wholly confined to females, although it is said that males are not exempt from it. The invasion of the disease is sudden and irregular, but in many cases decidedly periodical. In slight attacks the patient bursts into a fit of weeping, soon followed by convulsive laughter, which lasts for a longer or shorter time, and may be followed by comparative composure.

In more severe cases, the complaint is ushered in by a sharp pain in the abdomen or chest, which is soon followed by a sense of suffocation and oppression at the epigastrium. The bowels are tense, and the surface cold. The countenance varies; in some cases it is red and swollen, in others pale, and the features contracted. In some very severe cases, there is a convulsive affection of the muscles, amounting to clonic spasms. The urine is mostly discharged in large quantities, and has a light, limpid appearance.

Causes.—We seldom meet with this disease before puberty, or after the period of life when menstruation finally ceases; and as it mostly makes its appearance during the catamenial flow, it is supposed to have its origin chiefly in deranged uterine action.

Treatment.—During the paroxysms, the feet should be placed in warm water, and a hot sinapism applied to the lower part of the abdomen. The patient should take equal parts of cypripedin and scutellarin, one grain, every half hour, until the paroxysms subside. If the above be not sufficient to control the disease, the compound ginger and bayberry tea may be given freely, followed by ten or twenty of Bache's sudorific drops, or thirty or forty drops of the tinct. of castor, followed by a pill of asafœtida. After the paroxysm, the patient should take from five to ten grains of bebeerine, and the same amount of phosphate of iron, every day, for two or three weeks.

To remove the uterine affection, macrotin, caulophyllin, and senecin, should be used, as the nature of the case seems to indicate. When the disease is dependent upon indigestion and constipation of the bowels, tonics and laxatives are the remedies. If upon spinal irritation, the proper treatment will be found under that head.

CATALEPSY.—ECSTASY

Catalepsy is characterized by a temporary suspension of consciousness, sensorial power, and volition, the patient remaining in the precise position in which she happened to be at the commencement of the attack. An attack is the immediate effect of irritation and congestion of the brain, sufficient to suspend, for a time, the influence of the mind upon the body, through the medium of the brain and nervous system, but inadequate to interrupt the generation and flow of nervous influence, by which the voluntary muscles receive their tone.

The seizure may continue only a few minutes, or several hours, or even days. It generally comes on without any premonition, but sometimes vertigo, cephalalgia, a flushed face, forgetfulness, pain in the bowels, yawning, and depression of spirits, precede its approach. The eyes are generally open, fixed, and slightly turned up during the paroxysm. The aspect is death-like, the face pale, the lips closed and protruded, and the fingers semiflexed. The muscular

system alone is affected; the senses and intellect remaining unimpaired. On recovery, which is usually instantaneous, and as if from a deep sleep, there is no recollection of what has occurred. Nervous and hysterical women are most likely to suffer, and its occurrence appears to be favored by cold. This disease is not dangerous. Occasionally, however, cases terminate in apoplexy or insanity, or they may be connected with chronic softening, or with tumor of the brain. The term "*absence of mind*," is a slight form of catalepsy.

Ecstasy.—By this term is understood an analogous condition to that just described. The patient is insensible to all external objects, but is deeply absorbed in contemplating some imaginary theme. The eyes are immovably fixed, the face usually pale, the surface of the body cool, and the pulse and respiration natural. The duration of the attack is uncertain, varying from a few minutes to hours or days. Upon recovery, the patient generally remembers his thoughts and feelings more or less accurately, and sometimes tells of wonderful visions, etc. An attack is usually produced by causes which occasion a strain upon the mental functions, and is most frequently developed in persons of a nervous temperament.

Treatment.—During the paroxysms of catalepsy, or ecstasy, the head should be showered with cold water, followed by hot pediluvia, and stimulating liniments, with friction to the abdomen and spine. Some aromatic stimulant may also be administered, such as hot peppermint sling, or compound spirits of lavender. As soon as the paroxysms are passed, the cause of the disease should be sought for and removed, and the system invigorated by iron, and other tonics, in connection with fresh air, baths, and a generous diet.

CHOREA.

Chorea, or St. Vitus's Dance, is characterized by irregular contractions of the voluntary muscles, especially those of the face and limbs; there being incomplete subserviency of these muscles to the will. The movements increase and progressively extend until all the involuntary muscles are involved. Speech may be impaired or lost, and locomotion impossible. Inability to direct and harmonize voluntary movements, is a prominent feature. The movements are generally suspended during sleep. They are more frequently

marked on one side, in which case the disease is termed *hemichorea*. The features are very curiously twisted and contorted, and the articulation impeded. Endocarditis, or pericarditis, may supervene during its course. The memory also becomes impaired, the temper irritable, the countenance assumes a vacant look, the mind is enfeebled, the appetite irregular, the abdomen swollen and hard, the bowels are constipated, and the urine is of a high specific gravity, especially when the movements are very active, owing to the increased waste of tissue consequent on the disturbed state of the muscles and nerves. The disease is rarely dangerous, unless it merges into organic disease of the nervous centres, or of the heart, or into epilepsy.

Pathology.—The pathology of chorea is not accurately known. Some observers regard it as a disease resulting from perverted nervous function; others, that the blood is principally affected. There seems to be some connection between it and rheumatism, the latter occasionally preceding and accompanying it. The appearances found after death are usually slight, and by no means uniform. Softening of some portion of the brain and spinal cord has occasionally been observed.

Causes.—Chorea usually attacks children of from eight to sixteen years, although the old frequently suffer. It is caused by any thing that is capable of rendering the mucous system weak and irritable, as mental emotions, especially fear, terror, and religious enthusiasm, gastro-intestinal irritation, worms, retrocession of cutaneous eruptions, the suppression of habitual discharges, excessive sexual indulgences, onanism, difficult dentition, blows or falls, and deranged functions of the uterus.

Treatment.—Take scutellarin, thirty grains; cypripedin, twenty grains; carbonate of iron, two drams; port wine, one pint. Give one tablespoonful three or four times a day. The bowels should be kept open with small doses of euonymin, and the surface bathed with tepid water every morning. If the disease should be caused by suppression of the menses, macrotin should be given, in connection with iron; if by worms, santonin and podophyllin; if by ague, some of the antiperiodic compounds .

TETANUS.

Tetanus is often the result of wounds, and is a disease of the spinal cord, produced by causes at first of a local nature. The characteristic symptom is spasm. When the muscles upon the anterior part of the body contract most, so as to bend the body forward, it is called *Emprosthotonos;* when those on the back, *Opisthotonos;* when the body is bent to one side, *Pleurothotonos.* Tetanus may be acute or chronic, traumatic or idiopathic. The acute and traumatic are most frequent, and come properly under the care of the surgeon. This disease occurs most frequently in hot climates, from punctured and lacerated wounds in tendinous parts. It is common in military practice, and is more often observed in men than in women. The predisposing causes are not well known. The period of development greatly varies. Usually, however, it occurs in from one to thirty days from the time of the injury. It is a disease of the excito-motor nerves.

Symptoms.—At first there is pain and stiffness in the neck and about the jaw. The natural antagonism of the facial muscles is wanting, giving rise to a peculiar ghastly and puckered appearance. Thirst and dryness of the fauces, difficult deglutition and mastication, stiffness and rigidity of the neck, tonic spasms of the masseter and temporalis muscles, distorted eyeballs, dilated nostrils, pain shooting through from the lower end of the sternum to the back, caused by spasm of the diaphragm, are the usual symptoms. Then succeed general spasms of the abdominal and respiratory, and of the entire muscular system. The sphincters are involved in the general spasm; the bowels are, therefore, constipated, and the urine is retained. There is intense pain and profuse perspiration. The pulse, before full and strong, becomes weak. The intellect is unclouded until gradual asphyxia and exhaustion bring on the coma of death. In the acute form, the disease seldom continues beyond a few days.

Treatment.—The treatment is local and constitutional. The local treatment consists in dividing the nerve by making, close to the vessel, if possible, a V shaped incision down to the bone, so as to divide all the nervous communication between the part and the spinal cord. The part should then be enveloped in a warm poultice

of slippery elm, or put into a warm alkaline bath, or fomented, accordingly as these means produce relief to the patient. To the divided tissues atropin may be beneficially applied, to lessen local irritation. With a view to produce free sloughing, caustic potassa is recommended, its use to be followed by poultices and fomentation. The bowels should be opened by jalapin and cream of tartar. Then the tincture of lobelia, and a strong infusion of scutellarin and cypripedin should be given, at first in small doses, and gradually increased until free and copious emesis is produced. If this should not overcome the spasm, a vapor bath should be administered, and enemas of lobelia given until every muscle is relaxed, and the respiration and deglutition are normal and easy. The use of lobelia is much safer than that of tobacco, and its relaxing effects may be carried to a greater extent without endangering life. The extract of cannabis indica, given in three grain doses, repeated every hour or half hour until narcotism is produced, is highly recommended by Dr. James Miller. At the same time that these powerful sedatives and antispasmodics are acting upon the system, especial care should be observed to sustain the strength by nutritious enemas, by drinking nourishing broth and gruel, and the administration of stimulants and tonics. From one-tenth to one-eighth of a grain of Keith's strychnin given every two or three hours, until one or two grains are taken, has proved effectual. Of late, the application to the spine of solid ice, impacted in a large intestine or bag, has been highly recommended to allay inflammation of the spinal cord. It operates as a powerful sedative, and may be applied as long as the system is not prostrated by its effects, and is not followed by syncope, chilliness, and a feeble pulse. Aconite and belladonna, more especially the former, have been used to considerable extent in cases of disease of the spinal cord. Opium has been thoroughly tested in these cases, and found not to be well adapted to the removal of the difficulty. To procure rest, hyoscyamin, conium, and lupulin will be found preferable remedies. Aconite, as an antiphlogistic, is deserving of high reputation, although its antispasmodic tendency is not so great as that of lobelia. The tincture of the cannabis indica is often useful, and should be prepared from the inspissated extract. I will here remark that the strength of this remedy is variable. In the Pennsylvania Hospital an article has been used

so powerful, that one-twelfth grain has been the prescribed dose. It is well, therefore, to test the strength of each specimen of the remedy before administering the maximum dose, to which reference is above made. Chloroform and ether are thought to be beneficial; but these anæsthetics are not so valuable as the relaxing means above referred to. If, however, the circumstances should require their use, after other means fail, they deserve a trial. Counter-irritation over the spine, with the endermic use of aconitin, atropin, and morphine, will sometimes prove valuable adjuncts in treatment, but will seldom be necessary after the use of the means already described. Veratrin, from the veratrum viride, is another sedative agent of great power, that is applicable in cases of high sthenic inflammation, and will, therefore, be most useful in the inflammatory stage of this disease. Aside from these remedial measures, the use of hygienic means is imperative. Pure air, frequent ablutions of the surface, perfect freedom from care, quiet, and seclusion from noise and light, and all intruding visitors, must be observed. A summary of the constitutional treatment, adapted to the cure of this formidable disease, is this:—absolute rest and seclusion, purgatives to cleanse the alimentary canal, intestinal enemas of a nourishing and stimulating character, nutritious gruels and broth, given frequently in small quantities, cold applied to the spine as long as agreeable, and not too sedative; the use of lobelia, scutellarin, cypripedin, in infusion, to produce emesis and relaxation, with the early administration of tonics and stimulants, on the first appearance of prostration. Under this course of medication the majority of cases will recover, for I feel confident that this treatment is much more philosophical and effectual than that heretofore prosecuted by medical authors.

INSOMNIA AND SOMNAMBULISM.

Insomnia, or sleeplessness, proceeds in many instances from an over-excitement of the brain. It is a frequent incident in the early stages of insanity and meningeal inflammation. All exciting passions have a tendency to prevent sleep; and many acute diseases, in their early stages especially, act in the same way. Dyspepsia, mental anxiety, and utero-gestation, especially in those of a nervous, excitable temperament, are fertile sources of restlessness.

Dreams probably occur only during imperfect sleep, when there is partial activity of the nervous centres. They are often due to teething, a loaded bladder, irritation of the bowels, and imperfect digestion; and in some instances, when of a frightful character, are the precursors of apoplexy, insanity, epilepsy, and tubercular meningitis. In *incubus*, or *nightmare*, there are generally horrible or ludicrous apparitions, with always a distressing consciousness of inability to move or speak. The proximate cause is spasmodic contraction of the diaphragm and intercostal muscles. It may arise from indigestion, pressure from the stomach, or flatulence, with acid secretions.

Somnambulism is a species of dreaming, in which the bodily, as well as the mental functions, are affected. The somnambulist dreams, and carries out his conceit. His movements appear to have the precision of one awake. Intemperance is said to occasion it; and, in some instances, it appears to be connected with derangement of the uterus, or of the alimentary canal.

PARALYSIS.

The definition of paralysis, is weakness, or cessation of the muscular contraction, by diminution or loss of the conducting power or stimulation of the motor nerve.

Among the symptoms of paralysis, those manifested in the muscular and contractile tissue generally are the most marked. The loss of all tension in contractile fibres is most conspicuous in the paralysis of the facial nerves. In one case I found that all the furrows of the affected half of the face and forehead had disappeared within ten minutes after the malady had supervened. The skin becomes flabby and faded, the cheek is pendulous, and when an attempt is made to blow, is distended more easily than the healthy one. In an unmarried female, who was paralytic, I found that the abdominal parietes hung down like an empty bag. We not unfrequently meet with contractions in the paralyzed muscles, whether of a permanent or temporary character.

Causes.—The causes of paralysis are only partially known. Every period of life is liable to them, from the fœtus to the last stage of existence. There are a congenital, and a connate form of paralysis: of the latter we have an instance in the histrionic paralysis

caused by pressure on the forceps. During the period of dentition paralysis occurs frequently, both in the lower extremities and in individual limbs, whether convulsions have preceded or not, and they may exist during the whole term of life. Infancy and advanced age are more subject to cerebral, the middle period to spinal palsies. To the latter, especially in the shape of tabes dorsalis, the male sex are much more obnoxious than the female. An hereditary tendency is observed less frequently in paralysis, than in other nervous diseases. Paralyses differ from convulsions in their etiological relations, by being less frequently based upon anæmia, while the continuance of a stronger current to the central organs affords an etiological moment of consequence. It is thus that hypertrophy of the left ventricle favors the origin of cerebral paralysis in itself, and not only by the cerebral hemorrhage it may induce. A change in the constitution of the blood is more rarely followed by paralysis than by spasms. Lead, arsenic, woorara, and tobacco, are substances endued with a specific, paralyzing power. Among the pathological processes the rheumatic is the most productive of paralytic affections; and it frequently occupies the first position, both in regard to its immediate and its consecutive effects. The interruption and suppression of the cutaneous secretion, by a draught, or from getting wet, either paralyze instantaneously or gradually. Instances of the former mode of action are presented to us in facial paralysis, or paralytic aphonia; suppression of the copious and peculiar perspiration of the feet, less frequently of the palms of the hands, to which many individuals are liable, affords examples of the latter. In the latter cases there is not so much a metastatic process, as the older school assumed, as a coincident affection of the motor and sensitive nerves, a change in their condition of excitement, which gradually reacts upon the central organs.

Rheumatism is also of importance, in connection with paralytic affections, by the secondary alterations produced in the fibrous tissues, along and through which motor nerves take their course. The internal periosteum of the cranium, the dura mater, plays an important part in this way, it being either primarily affected, or secondarily to a similar malady of the pericranium; it acquires a still farther importance by accompanying the cranial nerves.

Rheumatic exudation within the sheaths of the nerves, though

often spoken of, has not hitherto been met with in the dead subject. The exudation of the cellular tissue of the skin, which Froriep terms a rheumatic node, and which he states to be accurately limited to the distribution of a nervous branch, or an entire nervous trunk, has not been confirmed by cadaveric investigation, nor have I met with it during life, although numerous cases of facial paralysis from rheumatism have come under my notice. Syphilitic and scrofulous processes induce paralysis, by their influence upon the osseous and membranous envelopes, by producing morbid growths, and by causing tumefaction of the glands lying in the vicinity of nerves.

Divisions of Paralysis.—All paralytic affections may be divided into two classes; the perfect and imperfect,—the former, including those in which both motion and sensibility are affected,—the latter, those in which the one or the other only is lost or diminished. The latter is divided into *acinesis*, paralysis of motion, and *anæsthesia*, paralysis of sensibility. Again, the paralysis may be *general* or *partial*. The latter is divided into hemiplegia, and paraplegia. When only a small portion of the body is affected; as the face, a limb, a foot, it is designated by the term *local* paralysis. When the irritation extends from the periphery to the centre, it is termed *reflex paralysis*. Diseases of the urinary organs, uterus, and intestines, are the most common affections peculiar to this form *Wasting palsy* is characterized by a remarkable degeneration and atrophy of the disabled muscles. Paralysis of the eye, or loss of sensibility of the retina to the rays of light, is called *amaurosis;* paralysis of the upper eyelid, *ptosis palpebræ;* loss of smell, *anosmia;* loss of taste, *ageustia;* and insensibility to the impression of sounds or deafness, *cophosis*. *Hysterical* paralysis, occurring in hysterical women, produced by fright, ovarian irritation, excitement, etc., is neither a disease of the nervous centres, nor of the motor nerves. *Rheumatic paralysis* is usually characterized by insensibility of the lower extremities, or of the extensor muscles of the forearm, or the deltoid and trapezius, rendering it difficult to raise the arm. The use of metallic poisons may induce mercurial and saturnine or *lead palsy*. *Paralysis from tabes dorsalis*, is observed frequently in youth, resulting from masturbation. It produces functional disturbance of the brain, heart, lungs, stomach, etc.; while,

if the irritation reflected from the spinal cord be permanent, structural lesions may result.

General Paralysis.—General paralysis affecting the whole system occurs rarely, excepting from injuries to the spine at the cervical vertebræ. It cannot take place without terminating in immediate death. This term is, however, usually applied to paralysis of the four extremities, whether any other portions of the body are involved or not.

Hemiplegia.—Hemiplegia, or paralysis of one side of the body, the most common form of palsy, is usually spoken of as "a paralytic stroke." The left side is more frequently affected than the right. It usually follows apoplectic attacks, in which event more or less of the premonitory symptoms of apoplexy precede it, indicating sanguineous engorgement or effusion of the cephalic vessels. Usually the facial nerve or portio dura of the seventh pair, is not involved in the paralyzing lesion; but the fifth nerve is affected so that the angle of the mouth is drawn slightly upwards, and to the sound side. The tongue is also often implicated. The articulation and respiration are imperfect, and the memory is weakened. If the third nerve be involved, the upper eyelid will drop, and the pupil be dilated, with a divergent squint.

In hemiplegia resulting from red softening of the brain, the muscles of one of the affected limbs are sometimes rigid and contracted; there is an unsteady gait, difficult micturition, a tremulous tongue, hesitancy of speech, difficult respiration, a feeble action of the heart, and involuntary discharges. If recovery take place, the leg first amends. In fatal cases, the limbs waste and become atrophied.

This affection is generally the result of organic lesions of the brain, especially the corpus striatum, and the optic thalamus. When intelligence and the memory are affected, the cerebral hemispheres are involved.

Paraphlegia.—Paraphlegia, or paralysis of the lower limbs or inferior half of the body, usually commences slowly, with weakness and numbness of the extremities, or with formication of these parts. The weakness increases by degrees, until there is complete palsy of the lower extremities, bladder, and sphincter ani; the patient is

obliged to assume the horizontal posture; while sloughs form on the hips and sacrum, which by their irritation and exhausting discharges hasten death. When the bladder is paralyzed, the urine is suspended, which soon becomes ropy, fetid, and alkaline. Involuntary movements and spasms are frequent.

Local Paralysis.—Local palsies are liable to be produced in any part of the system. They frequently result from injuries, exposures to cold, and debility arising from some exhausting influence, and pressure. It may involve a single muscle, a whole limb, or any organ of the body. Thus, in paralysis of the face, the effect of pressure on, or injury to the portio dura or facial portion of the seventh pair of nerves, the morbid change is remarkably striking; the features on the affected side being blank, unmeaning, and void of expression. The orbicularis palpebrarum muscle is powerless, the nostrils do not dilate, the cheek hangs loose, and the angle of the mouth droops. Paralysis on both sides of the portio dura rarely occurs. In this affection, the nostrils are observed motionless, the cheeks are flat and relaxed, the eyes are incapable of being closed, there is defective articulation with regard to the sounds formed by the lips, while those produced by the tongue are unimpaired.

Wasting Palsy.—This form of paralysis is characterized by a degeneration and consequent loss of volume and power of the voluntary muscles, there being no diminution of the intelligence, or of the sensibility, in any other portion of the body. The atrophy may affect the upper or lower limbs, or more rarely the voluntary muscles of the entire body. Fibrillary tremors or convulsive quiverings of some of the fasciculi which form the muscle, may occur. There is weakness, which daily, though slowly, increases. Tactile and common sensibility are generally unimpaired, and there is no tremulous agitation. Occasionally there are neuralgic or rheumatic pains, and great sensitiveness to cold. Its duration varies from nine months to five years. As long as the disease is confined to the extremities, there is hope of arresting it; but when it has invaded the trunk, the prognosis is most unfavorable. General muscular atrophy occurs during all periods of life, while the partial

form is most common between thirty and fifty years of age. Males are more subject to it than females. It is hereditary, and is developed by exposure to cold wet, etc.

Pathology.—This affection consists of a granular and fatty degeneration of the muscular fibre. Although there is no general depression of the nutritive functions, yet that of the muscular fibre is affected, owing to some unknown constitutional peculiarity. The affected muscles are always wasted, and sometimes quite annihilated. The muscular fibrillæ become degenerated into a granular amorphous substance or into fat globules; the empty sarcolemma or sheath of the elementary fibre having been broken up, so that only a little connective tissue remains.

Mercurial Palsy.—This form consists of a convulsive agitation of the voluntary muscles. In advanced stages, articulation, mastication, and locomotion are performed with difficulty; the use of the hands is almost entirely lost; the skin acquires a brown hue, and the teeth turn black.

Lead Palsy.—This form, which usually appears as a sequel to colica pictonum, exerts a peculiar noxious influence over the nerves of the hand and forearm, owing to which the extensor muscles of the hand and fingers become paralyzed, so that when the arms are stretched out, the hands hang down by their own weight, (drop-wrist.) There is a saturnine taste, and a similar odor of the breath. Neuralgic pains are occasionally experienced in the arm, and in other portions of the body. A characteristic symptom is the existence of a blue or purplish line—the sulphuret of lead—at the margin of the gums, which is probably due to the action of sulphureted hydrogen on lead contained in the saliva and buccal mucus. Plumbers, painters, color-grinders, etc., are the usual sufferers from this affection. Their systems become contaminated with the lead, and hence they are subjected to colic, gout, spasms of the respiratory muscles, neuralgia, and paralysis.

Paralysis Agitans.—This affection is characterized by a continued tremulousness, usually commencing in the hands and arms, or in the head, and gradually extending over the whole body. The disease progresses slowly. In the advanced stage, the agitation is

often so violent as to prevent sleep, all locomotion becomes impossible, deglutition and mastication are difficult, the body is inclined forwards, and the chin bent on the sternum, the urine and fæces pass involuntarily, and coma, with slight delirium, closes the scene.

It affects principally the aged, and those whose systems are debilitated by excessive intellectual or corporeal labor, intemperance, sexual indulgences, etc.

Treatment.—In the treatment of the various forms of palsy, a careful investigation into the nature and cause of the disease should be instituted; and, if produced by a specific poison in the blood, such as lead, mercury, etc., an attempt should be made to free the system of it. Thus, lead may be neutralized with sulphuric acid, and mercury by sulphur vapor baths, and the syrup of stillingia. If originating from spermatorrhœa, masturbation, excessive mental labor, or the abuse of alcoholic stimulants, these excesses should be corrected. When produced by organic lesions of any portion of the nervous system, an attempt should be made to correct the pathological condition on which the disease depends. When it is the result of plethora, as is the case when following some forms of apoplexy, a thorough and active hydragogue cathartic should be promptly administered. A grain of jalapin, and half a dram of anti-bilious physic, serves this purpose. An ounce of the fluid extract of jalap and senna, or two or three compound podophyllin pills may be used. The action of the purge may be assisted by stimulating enemata. Dr. Tanner very truthfully remarks, that strychnin, nux vomica, setons, issues, blisters over the vertebræ, mercury, and cold baths, have entirely failed in producing beneficial results in the various forms of palsy. As soon as the general treatment, and that which has been directed against the immediate causes of the difficulty have been thoroughly applied, specific medication should be resorted to. The remedies which appear to operate most favorably in this disease, are phosphorus, iron, potassium, sulphur, macrotin, viburnin, rhus radicans, xanthoxylin, prussic acid, and galvanism. The remedy with which I have been most successful in almost every form of palsy, is that of rhus radicans, in doses of from three to ten drops of the tincture every two or three hours. Viburnin also possesses a direct exciting influence upon the motor nerves, and may be given in doses of

three or four grains four or five times a day. Xanthoxylin is another remedy which exerts a powerful stimulating influence upon the nervous system, and may be used when other means fail. Macrotin and acetate of potash are indicated when the paralysis is associated with a rheumatic tendency; and hypophosphite of iron, and prussic acid, when there is a feeble condition of the nervous system. Iodide of potassium, and of ammonia, have been very successfully used in many cases. They are usually given in two or three grain doses, four or five times a day. Ignatia, strychnin, and nux vomica, have been extensively used in paralysis, but have never been found beneficial, excepting in chronic stages of the disease. Galvanism, properly applied, may prove of benefit in connection with other treatment. Stimulating liniments, friction, and tepid baths are also beneficial. In all chronic forms of the disease, the nervous system should be thoroughly invigorated by cypripedin, scutellarin, iron, quinine, cod-liver oil, country air, and a generous diet.

HYDROPHOBIA.

Hydrophobia, or rabies, is a most distressing and fatal malady, occurring spontaneously in the canine and feline races, and communicated to man and other animals by inoculation with the saliva.

With a near approximation to truth, we may assert that it is produced by the impression of the rabid virus, secreted from the various follicles and glands, and poured out upon the mucous membrane of the alimentary canal, and thence by the reflex action of the nervous system, are the spasms produced, acting as centres or sources of irritation, as do teething in infants, and indigestible substances in the stomachs of children, both of which are capable of exciting spasmodic action and convulsions in their uninjured organisms.

That the virus is thus secreted, is indisputable,—or whence the power of the rabid animal to inoculate his fellow by a mere abrasion of the cuticle and a suffusion of the part with a little saliva, or mucus? Whence, also, the "signs of digestive disorder"—the "difficulty in the deglutition of liquids"—the coming on of "singular nervous paroxysms"—the "sensation of stricture or oppression felt about the throat and chest," and the "painfully embarrassed

breathing?" Whence, also, the "copious secretion of a viscid mucus in the fauces, which the patient spits out with a sort of frantic vehemence and rapidity," or pulls out the "viscid secretion" with his fingers, which are "characteristic features of the disease," as well as "one of the most striking phenomena of the case?"

In the commencement of the manifestations of hydrophobic symptoms, "acute pain, or shocks of pain, are now and then felt in the epigastrium," where the poisonous virus is most largely effused. The "tongue is generally furred, often a burning in the throat, with thirst which cannot be allayed;" and, finally, the "skin is covered with a viscid and offensive sweat."

Treatment.—Of the treatment of rabies, Prof. Livczey remarks, that the nature of the disease, the symptoms manifested, and the post-mortem appearances, (so far as they are worth any thing,) indicate the use of such medicines and means as will at once, by their diffusive nature, penetrate and cleanse the pulmonic and digestive apparatus of the morbid secretions as fast as they are effused, and stimulate and uphold the vitality of the nervous system. If these morbid secretions are not removed, but are fastened within and upon the patient, they must necessarily act powerfully upon the sentient extremities of the afferent nerves, and by the reflex action are conveyed back to the circumference by the efferent nerves—the fifth and eighth pairs particularly—to the face, pharynx, and larynx, and upon this excito-motory system of Sir Marshall Hall the violent spasms mainly depend.

Holding it to be a self-evident truth that the hydrophobic virus is poured out upon the mucous membrane—otherwise the disease could not be communicated by a *bite*, or the saliva—the indication in treatment is to remove the *cause*, and the *effect* will of necessity cease.

For this purpose we should have prepared the following tincture: Myrrh, one pound; capsicum, two ounces; brandy, one gallon. Let these macerate about ten days in a warm place; decant, and add to the clear tincture one-half pound each of lobelia seed, capsicum, and valerian. After standing an additional ten days, the tincture is fit for use.

Administration.—When the undoubted symptoms of hydrophobia, which are known to every one, manifest themselves, with the pa-

roxysms supervening, let the wound or cicatrix be kept constantly wet with cloths saturated with this tincture; use the hot, stimulating foot-bath, or the warm vapor-bath; if the surface be cold and cramped, give a strong infusion of bayberry and capsicum, with from two to three tablespoonfuls of the above tincture, every twenty, thirty, or sixty minutes, according to the severity of the symptoms and the obstinacy of the paroxysms, repeating the same until free vomiting ensues. As an adjuvant, to shorten the convulsions, chloroform may be inhaled, and injections of the above tea and tincture may be conjoined; indeed, the case may occur where the difficulty of swallowing is so great, that our whole dependence, for the time being, must be upon these latter means, conjoined with the hot or vapor bath. In such cases vitality is so much depressed, that these stimulo-relaxant injections are generally retained, until they impress the whole system, and produce full vomiting.

The *modus operandi* of this treatment will be apparent upon a moment's reflection. In the first place, the astringent or "anti-canker" infusion of the bayberry, rendered diffusive and stimulating by the capsicum, is a powerful detergent to the fauces and alimentary canal, while it stimulates, at the same time, the whole glandular system to a more healthy action. The stimulating foot-baths have a derivative effect; and the vapor-bath both assists in relaxing the spasm, equalizing the circulation, and throwing all effete matters to the surface,—and thus are these "copious offensive perspirations" removed; while the compound tincture of lobelia, containing, as it does, the sanative properties of the myrrh, the diffusing, stimulating, and warming properties of the brandy and capsicum, the tonic and sedative effects of the valerian upon the nervous system, and the potent, anti-spasmodic, diffusible, and revivifying properties of the lobelia, when thus combined, exert a generally recuperative power by relaxing nervous spasms; freeing the system (by emesis) of all irritating, poisonous secretions; by stimulating the organs of vitality to healthy action, and restoring the whole economy to its wonted healthy play.

After the bath, the vomiting, &c., the patient will become tranquil, and pass, perhaps, several hours in refreshing slumber,—to awaken, however, to a renewal of the paroxysms, dread of water,

&c., because fresh quantities of poison are secreted and thrown upon the *prima viæ*. These paroxysms must be overpowered, and the poison removed again and again by a *repetition* of the *same course* till all is calm again; administering during the *remissions*, quinine and hydrocyanic acid largely, and repeatedly; and by thus persevering for a few days, we shall have the pleasurable satisfaction of witnessing a recovery from a disease which is emphatically the opprobrium of medical science.

SECTION XII.

DISEASES OF THE URINARY ORGANS.

NEPHRITIS.

Nephritis or inflammation of the kidneys, may arise from exposure to the cold and damp, mechanical injuries, renal calculi, innutritious food, combined with intemperance, metastasis of gout or rheumatism, the abuse of stimulating diuretics, as well as from the administration of cantharides, or oil of turpentine. It occurs rarely, and terminates either in resolution, suppuration, abscesses, or total destruction of the gland. In most examples, the mucous membrane lining the pelvis and infundibula is involved, which is known as *pyelitis.*

Symptoms.—The symptoms are acute pains in the region of the kidneys; the pain sometimes extending along the ureter to the neck of the bladder, or to the groin, scrotum, or testicle, which is greatly aggravated by pressure. There is also numbness of the thigh, chills, fever nausea, vomiting, great thirst, a hard, frequent, and full pulse, constipation, and tympanites. The urine is at first clear, but soon becomes of a dark, red color, and frequently contains renal casts, with blood and pus-corpuscles. Occasionally there may be suppression of urine. The patient feels easiest when on the affected side; sitting and walking cause much pain. The disease may terminate, at an early stage, in coma, owing to the retention of urea in the blood, and the consequent poisoning of the system. In other instances, typhoid symptoms appear, and the patient gradually sinks from pure exhaustion. When the inflammation ends in resolution, the patient appears to get well, but the gland frequently remains

somewhat indurated. When abscesses form, they occasionally lead to ulceration, perforation of the capsule, the formation of renal fistula, and the establishment of a purulent discharge. In favorable cases, however, the pus passes out by the natural passages, and is found in the urine. The detection of pus in the urine, is by no means a proof that the kidneys are affected, as it may be derived from the mucous lining of the urethra, bladder, or ureters.

Diagnosis.—Nephritis may be confounded with nephralgia, perinephritis, spinal disease, or lumbago. In irritation of the kidney from a stone—calculous *nephralgia*—the symptoms are similar to those just described. The local suffering, however, in the latter, when the stone passes along the ureter to the bladder, is much greater than in nephritis, while the general disturbance is less. In perinephritis, and in spinal disease, the symptoms are less acute, appearing more slowly, and giving rise to pain only in the affected part. In lumbago, there is neither nausea nor vomiting, the appetite and bowels are natural, there is no fever, and the urine does not contain renal casts, albumen, nor pus, although it may be loaded with urates.

Treatment.—Acute nephritis, although not a very common disease, yet occasionally exists as an idiopathic affection, and can be controlled by the use of hot packs, vapor baths, lobelia emetics, mild purges, and aconite or veratrum. In malarial districts, quinine and iron should be added to the treatment.

ACUTE DESQUAMATIVE NEPHRITIS.

Acute desquamative nephritis consists of disease of the epithelial or gland-cells lining the convoluted uriniferous tubes, owing to the elimination of some matter from the blood, which is not naturally excreted by the kidneys. The cells may become atrophied, or disintegrated, which may tend to check secretion by mechanically obstructing the tubes. At the same time that the gland-cells are undergoing changes, an effusion of serum and fibrin takes place into the cavities of the tubes, occurring from a retardation of the circulation through the vessels of the Malpighian tuft. The serum mingles with the urine, rendering it albuminous; while the fibrin solidifies, entangling in its substance the cast-off epithelial cells, and is detected in the urine in the shape of

epithelial tube casts. If any of the walls of the vessels give way, blood corpuscles will be found in the casts, while the urine will present a dark-colored sediment. This renal affection may arise from intemperance, starvation, exposure to wet and cold, cholæmia, etc., but particularly scarlatina. In some instances general dropsy with albuminuria may occur without desquamation of the renal epithelium.

Symptoms.—The disease usually commences with rigors or chills, which are soon followed by fever, cephalalgia, restlessness, pain and tenderness in the loins, and frequently vomiting. The dropsy is an early symptom, characterized by a puffed condition of the face, succeeded by general swelling of the areolar tissue throughout the body, and by effusion of fluid into one or more of the serous cavities. There is a frequent desire to void urine, which is scanty, of a dark smoking color, and highly albuminous, consisting of masses of coagulated fibrin, epithelial casts and cells, blood corpuscles, and occasionally crystals of uric acid.

Prognosis.—The prognosis is generally favorable; the points to be feared are the occurrence of uræmia, owing to suppression of the kidneys; or permanent structural disease of the glands.

Treatment.—In this form of inflammation, in addition to the treatment requisite for simple nephritis, benefit will follow dry cups over the region of the kidneys previously to the application of hot packs, and the use of large draughts of a warm decoction of verbascum thapsus. In some cases, I have known immediate relief to follow an administration of four or five grains of sulphite of soda every two or three hours, in connection with a liberal use of althæa officinalis. If the disease be of an obstinate character, one-half grain of colocynthin, and one-fourth grain of jalapin should be taken sufficiently often to maintain a gentle excitement of the bowels. Vapor baths, lobelia emetics, hot packs, and diaphoretic teas, in connection with the tincture of veratrum viride, are the principal resources for this malady.

CHRONIC DESQUAMATIVE NEPHRITIS.—This form of nephritis is characterized by a gradual destruction of the epithelium of the uriniferous tubules, which appears in the urine partly in an amorphous state, and partly in granular casts consisting of the disinte-

grated cells. The tubules thus deprived of their cells, gradually lose their epithelial lining, and become atrophied or filled with a new material; or they continue to be nourished, secrete serum in their cavities, and finally become dilated into cysts. The urine is more or less albuminous, and is found, upon microscopical examination, to contain abundant amorphous granular matters, either scattered or in the form of cylinders, which have probably been thrown out from the surface of the denuded tubes, and are known as granular epithelial casts. This state of the kidney was noticed by Dr. Todd to be common in gouty persons, and hence from him it has received the name of "*gouty kidney.*" It may exist for some time without producing any marked symptoms, or it may be masked by the progress of some pre-existing and causative malady. It is usually attended, however, with failing health and strength; a dry, harsh, and sallow skin; variable appetite; dyspepsia; diarrhœa; rheumatic pains; pulmonary diseases; and occasionally epistaxis. The patient loses strength, but this may be concealed if anasarca be present. The urine is passed more frequently than in health. When the disease gradually advances, the heart or lungs may become diseased, the nervous system becomes implicated, and convulsions or coma ensue.

Treatment.—In the treatment of chronic desquamative nephritis, as well as in all other forms of inflammation of the kidneys, active and stimulating diuretics should be avoided. The poisonous constituents of the urine should be removed by diaphoretics, mild purges, and hot baths. The inflammation of the urinary tubules can generally be controlled by the use of helonin and gelsemin. Take helonin twenty grains, gelsemin one grain, saccharum album one dram. Mix, and make twenty powders. Let one be taken every two or three hours. Where there is dropsical effusion, one dram of the fluid extract of pareira brava may be administered three or four times a day; and if there be chronic degeneration of the kidneys, the fluid extract of hydrangea should be used. Usually one or two drams a day will arrest the progress of the difficulty. The system should be supported by quinine, iron, and general tonics. Where there is a rheumatic or gouty diathesis, associated with the disease, colchicum, iodide of ammonia, bromide of potassium, ma-

crotin, and acetate of potash will be indicated. General baths, a nutritious diet, and rest, are valuable auxiliaries.

BRIGHT'S DISEASE, OR RENAL CACHEXIA.

In the year 1837, Dr. Bright first pointed out the frequent connection of dropsy with a degeneration of the structure of the kidneys, of which the prominent feature is the deposition of a peculiar granular matter in the substance of the renal gland, together with the gradual atrophy of its cortical and tubular structure. The fatty form, or fatty degeneration of the kidneys, may be the result of acute desquamative nephritis, or may arise from scrofula, bad living, constant exposure to wet and cold, intemperance, etc. The disease occurs gradually, as in the inflammatory form, and occurs in persons of advanced years, suffering from cardiac and bronchitic disorders.

Symptoms.—The symptoms of the fatty form are a gradual increasing debility, a frequent and irritable pulse, pallor and puffiness of the face, as well as of the skin generally, frequent micturition, dyspepsia, and vomiting. There is always a tendency to grave inflammations of the serous membrane—such as pericarditis, peritonitis, meningitis, and pleurisy. In some instances, œdema of the lungs may occur suddenly, producing serious dyspnœa, which is soon followed by convulsions, and ultimately coma, which terminates in death.

Pathological Changes.—On examining the kidneys of those who have died of this form of disease, the tubes are observed more or less obstructed by fatty granules, which have gradually accumulated in the epithelial cells of the tubes. These separate, and even burst, liberating their contents, and in this way obstructing the tubes, and compressing the secreting and surrounding textures. Gradually the vessels are so compressed, that the whole organ appears bloodless, and is of a light fawn, or dirty-white color. The fibrous texture is occasionally hypertrophied, causing contractions around the convoluted tubes, thus producing irregularities on the surface. Occasionally, large accumulations of the fatty granules take place, causing the tubes to burst, and presenting light fawn-colored spots, or granulations, more or less numerous, which are scattered over and through the cortical substances.

Amyloid Degeneration, or the Waxy Form.—Waxy lardaceous, or amyloid degeneration of the kidney probably never exists alone, for it is a constitutional affection. A large proportion of the cases of Bright's disease, and especially of the chronic ones, are assignable to this change. The changes which the kidney undergoes cannot be distinguished immediately with the naked eye, but if a solution of iodine be applied to the anæmic cortical substance, a number of brownish-red points appear, corresponding to Malpighian bodies, with sometimes fine streaks, which are the afferent arteries, and next to this, when the disease is very severe, red parallel lines are also seen within the medullary cones, lying very close to one another.

The appearances in the urine characteristic of Bright's disease, are the separated casts of the tubuli uriniferi, which consist of four kinds—*exudative*, *desquamative*, *fatty* and *waxy* transformations. The exudative consist of the coagulated exudation or fibrin, which, in the inflammatory form, is poured into the tubes, so as to present a mould of their interior. They mostly occur in acute cases, are frequently associated with blood corpuscles, and sometimes with desquamative casts and epithelial cells.

Desquamative casts consist of masses of the epithelium lining the tubules, sometimes closely aggregated together side by side; at others, agglutinated by means of molecular exudation. They result from a separation of the lining cell membrane from the interior of the tube, in patches of greater or less extent, and may be associated in acute cases with exudations, and in chronic, with fatty or waxy transformations. Fatty casts consist also of patches of epithelium, which, however, have previously undergone the fatty transformation, by the accumulation of a greater or less number of fatty granules in their cells. Occasionally the cells burst, and fill the tubes with fatty granules, among which no epithelium can be distinguished. At others, the cells are less changed; fatty accumulation only commencing. This form of casts is often associated with fragments of the desquamative, with a few cells more or less fatty, and with waxy transformations. Waxy casts present an exceedingly diaphanous and structureless substance, which, according to Dr. Geo. Johnson, is secreted by the basement mem-

brane after the destruction of its epithelial cells. Not unfrequently they are associated with the fatty and desquamative casts.

The exact signification of the casts has yet to be fully determined by clinical investigation. It is highly probable, however, that the exudative casts indicate the most acute form of lesion; the desquamative, a subacute; the fatty, a chronic lesion; and the waxy, a lesion destructive of the tubular textures. But, as all these changes may be going on in the kidney at the same moment, so we may find these various casts mingled with one another in various proportions, combined with other structural elements. The predominance in the number of one kind of cast over another, will, however, serve to indicate to the pathologist, with tolerable correctness, the nature of the change which is going on in the renal organs. They vary greatly in size, being often much smaller than any kind of uriniferous tubes, a circumstance indicating considerable contraction of their calibers. In addition to the elements just described, tyrosin and leucin are observed in the urine.

Treatment.—The treatment of granulated kidneys will depend much upon the stage of the disease, and the constitutional complications. The condition of the stomach, bowels and skin should receive especial attention, as the disease greatly depends upon a defective condition of these emunctories. One of the most important features in the treatment is to maintain a free action of the skin, as, in this way, the blood is diverted from the kidneys, and purified. In the treatment of Bright's disease, like other chronic and acute forms of inflammation, it must be borne in mind that all stimulating diuretics act as excitants to the renal circulation, thus increasing the congestion and inflammation; hence, they should not be used. The specific treatment for degeneration of the kidneys consists in the building up of the system with cod-liver oil, Mecca oil, hypophosphite of iron, tonic tea and wine, and the administration of helonin as a specific agent. Of all the agents known, none has so direct an influence upon the parenchyma of the kidneys as the helonin. Its influence appears to be specific, relieving inflammation and degeneration of its tissues. I have been in the habit of giving from three to ten grains a day. It may be given with cod-liver oil, iron, or such other agents as the complications of the case may indicate.

There are other agents that may also be used in this disease, and which act specifically upon the kidneys. This is especially the case with eupurpurin and populin. The eupurpurin not only possesses tonic properties, but also a stimulating influence, and in cases where extensive disorganization occurs, helonin and eupurpurin in equal proportions should be used. Populin is not only a tonic, but a stimulating diuretic; hence, should not be used in the active stage of the disease, but where the affection is far advanced, and the renal capillaries much debilitated, populin may be added to the treatment. When there are dropsical accumulations, they should be removed, as directed under the head of that disease. When there are symptoms of poisonous quantities of urea accumulating in the system, a liberal use of carbonate of ammonia, and mild purgatives, will usually relieve them. Much benefit will also be derived from the use of vapor baths, and, in case of much debility, the cod-liver oil should be given with brandy. In bad cases, I have derived benefit from the irritating plaster, applied over the kidney, and continued until free counter-irritation was produced. Much benefit has also followed the use of the Mecca oil water, by drinking it freely as pumped from the wells. Prof. I. G. Jones speaks highly of the exts. of elder bark and dandelion, made in the form of a pill with leptandrin. The above treatment has cured a large number of very bad cases of Bright's disease, and from my experience, I believe it perfectly amenable to treatment in the early stage. Two cases that I now have under treatment, have had albuminuria for years, and previously to coming under my charge, manifested all the indications of fatty degeneration of the kidneys, and yet, in less than three months' treatment, all traces of albumen have disappeared from the urine, and a good degree of health is enjoyed.

NEPHRALGIA.

Neuralgia of the kidneys is characterized by acute pain, occurring in irregular paroxysms, and occasionally assuming a periodical form. The pains generally shoot downwards towards the groin, as in nephritis. Its cause is the same as that of neuralgia elsewhere. It probably originates in the nervous centres; or it may depend upon miasmatic influence, or general debility; or, again, it may be

traced to a gouty or rheumatic diathesis. Occasionally it appears to be connected with hysteria.

Calculous Nephralgia.—This is a most painful affection, depending upon the passage through the ureter of a calculous, or other solid body, coming on when this enters the duct, upon leaving the pelvis of the kidney, and rarely ceasing entirely until discharged in the bladder. The local symptoms are similar to those occurring in acute nephritis, only in a much more severe form; the constitutional disturbance is, however, less.

Treatment.—Neuralgia of the kidneys may be cured as neuralgia of other organs of the body. The neuralgia mixture, given in one dram doses, three or four times a day, will usually answer the purpose. The treatment for calculous nephralgia consists in the use of anodynes and antispasmodics. Where the pain is violent, a lobelia emetic should be given, followed by one grain of opium, and a few drops of tincture of gelsemin.

RENAL TUBERCULOSIS.

Tuberculous disease of the kidney, though not frequent, is occasionally observed in phthisis, occupying either the substance of the gland, its investing coat, or the lining membrane of the pelvis and calices. They vary in size, and are found in all stages. Death usually occurs in from twelve to eighteen months after the commencement of the symptoms indicative of kidney affection; which may be due to exhaustion, or more rarely to uræmia or ichorrhæmia. There may be hypertrophy of the gland, owing either to the confluence of softened tubercular deposits, or to the gradual distention of the pelvis by retained urine and pus. There are night-sweats, rapid emaciation, diarrhœa, and occasional burning pains in the loin corresponding to the seat of disease. The urine contains pus and blood; or there may be small, cheesy-looking masses, which are found to contain, upon microscopical examination, tubercular matter, granular debris, elastic fibres, and epithelial casts of the tube.

Other morbid alterations of structure besides those noticed, are also observed in the kidneys, similar to those found in other organs,

as congenital mal-position, hypertrophy, atrophy, softening, induration, cysts, hydatids, and osseous and cartilaginous degeneration.

Treatment.—The treatment for tuberculous disease of the kidneys, is the same as tuberculous affections generally.

RENAL CANCER.

Cancer may exist, though rarely, in the kidneys, in all its varieties and stages. The absorbent glands in the vicinity are often affected, as well as other neighboring structures. It is most common in middle and advanced life, and affects men more frequently than women. It occurs usually in the right kidney, and is characterized by severe, lancinating, and long-continued pains; the passage of pure, or nearly pure blood from the kidneys, forming coagula in the urine, and frequently returning; while a careful examination of the abdomen will detect a tumor through its parietes. There are slight nausea, anæmia, the peculiar pallid hue of the face characteristic of cancer, and towards the close, dropsy of the abdomen and lower extremities.

Treatment.—The only treatment that will prove of benefit in this disease, is to allay the pain with anodynes, and mitigate the disease by giving four or five drops of Donovan's Solution, four or five times a day, in a teaspoonful of fluid extract of humulus lupulus.

DIABETES INSIPIDUS, OR DIURESIS.

By these terms are understood an excessive secretion of pale, limpid urine, without saccharine matter. The principal symptoms characteristic of this affection, are insatiable thirst, (*polydipsia,*) and the elimination of a large quantity of urine. Usually the watery constituent of the latter is alone increased, the total amount of urinary solids not being greater than in health. These symptoms are usually preceded by a variable appetite, constipation, and derangement of the cutaneous functions. In some cases the copious secretion of urine is only occasional, following over-mental or physical excitement.

It is distinguished from diabetes mellitus, in its symptoms being less severe, and by the presence of urea, and the absence of sugar in the urine.

Causes.—Diuresis is caused by any train of influences that impoverishes the blood, or renders the nervous system irritable, as intemperance in eating or drinking, excessive mental excitement, the use of tobacco, venereal and other excesses, etc.

Treatment.—The constitutional debility should be overcome by iron, baths, fresh air, cod liver oil, and general tonics. From one-eighth to one-fourth of a grain of apocynin, administered four or five times a day, is a specific for this disease.

DIABETES MELITUS.

Diabetes mellitus, melituria, or glucosuria, is a complicated form of disease, characterized by augmentation of urine, containing sugar. The chemical constituent of diabetic sugar, is that of grape sugar, or glucose.

The *pathology* of this disease is considered in our article on Glucohæmia, to which we refer the reader.

Symptoms.—The first indications of this disease are malaise, dry and harsh skin, intense thirst, pain in the lumbar region, constipation, with alternate chills and fever. After a time, the general health begins to give way, and there is muscular weakness, with a loss of all sexual power, pain in the loins, coldness of the extremities, a burning sensation in the hands and feet, increasing debility, with a manifest loss of weight, a chloroform odor of the breath, sponginess of the gums, decay of the teeth, mental depression and irritability, together with a constant feeling of sinking in the stomach, inducing a voracious appetite. The disorder progresses slowly and insidiously, and frequently terminates in pulmonary consumption.

Diagnosis.—Upon examining the urine, it is found to have a sweetish taste, and an odor like that of new milk. It is of a pale straw color, is secreted in very large quantities, and does not undergo putrefaction, even when kept for several weeks. The specific gravity varies from 1030 to 1050; the more aggravated the disease, the greater the density. The most convenient means of ascertaining the presence of diabetic sugar, says Christison, is to add to it some yeast, which gives rise to various fermentation, a most delicate test, as it can detect one part of it in a thousand parts of urine. Every cubic inch of gas given off, nearly corresponds, in round numbers,

with one grain of sugar. Another equally delicate test, is the growth of torulæ, which make their appearance in the urine whenever saccharine matter is present, in however minute proportion. In the potash test, in which the suspected urine is boiled in a test-tube, with an excess of liquor potassa, the liquid will assume an orange yellow, or brown or claret color, in proportion to the quantity of sugar present. (Also, see page 60.)

Causes.—There is, probably, an hereditary predisposition to this affection, consisting in a relaxed state of the tissues, and an irritable condition of the nervous system. A similar predisposition may be acquired by masturbation, venereal excesses, the use of tobacco, alcoholic stimulants, improper food, deficient clothing, impure air, irregular eating, exposure to damp and cold, protracted grief or anger, and injuries to the brain or spinal cord.

Treatment.—In the treatment of diabetes too much pains cannot be taken to maintain a healthy condition of the system generally. This can be accomplished by fresh air, frequent baths, and a generous diet. The practice of confining the patient to a flesh diet, has proved unsuccessful, and the largest experience has shown that a mixture of animal and vegetable food exercises the most favorable influence over the disease. The function of respiration should also receive especial attention, as it has uniformly been observed that a copious respiration of highly oxygenated atmosphere, tends to diminish the quantity of saccharine matter in the urine. The bowels and liver should be kept gently stimulated by means of small doses of leptandrin and leontodin. Aletris farinosa is a remedy that has been used with great success in this disease. It may be given by adding two ounces of the root to one pint of good French brandy, and allowing the patient to take one tablespoonful after each meal, and upon retiring. One grain of the hydro-alcoholic extract, and one-twentieth of a grain of strychnin, made in the form of a pill, has also proved a valuable remedy. Cod liver oil, where the system is debilitated, may be used with benefit. Mecca oil has also been employed successfully in this disease. It has also been found that sugar, taken in large quantities, proves of great value, and has cured many bad cases. The inhalation of oxygen gas has been resorted to successfully.

CHYLOUS URINE.

Chylous urine consists of a milky appearance of the urinary secretion, from the presence of fatty matter in a molecular state, together with one or more of the following ingredients,—blood-corpuscles, fibrin, albumen, or chyle. It is attributed to some derangement of the assimilative process, in which the chyle is not converted into blood.

Symptoms.—In slight cases there is usually some degree of feverishness, uneasiness in the back and loins, thirst, a dry tongue, and constipation. When of a more severe type, the symptoms approach to those of diabetes, the thirst is more urgent, the appetite unnaturally craving, and there is some degree of emaciation and debility. In this form, the urine is apt to coagulate before it leaves the bladder, and the patient experiences difficulty in passing it, the urethra being blocked up by the clots. No alterations in the kidneys, perceptible to the naked eye, have as yet been discovered.

Causes.—Besides the immediate cause of this condition previously mentioned, exposure to cold, extreme fatigue, luxurious living, and the action of mercury, may produce it. Residence in a hot climate seems to predispose to it.

Treatment.—As this is a mere symptom of some constitutional disease, that condition should be removed.

URINARY CALCULI, LITHIASIS, OR GRAVEL.

Stone in the bladder may be composed of lithic acid, lithate of ammonia, phosphate of lime, triple phosphate of ammonia and magnesia, or of the oxalate of lime.

Symptoms.—Irritability of the bladder, frequent desire to urinate, sudden stoppage of the stream during micturition, pain in the neck of the bladder,—most severe after urinating; a constant desire and effort on the part of the patient to relieve the pain by pulling at the end of the penis. The above symptoms, although nearly always present, are not to be relied on unless the existence of stone be demonstrated by means of a sound introduced into the bladder. This can be done by placing the patient on his back, and introducing the sound when the bladder is free from irritation, and, if there

be stone, the sound will be distinctly heard as the instrument strikes it.

Treatment.—If stone be present, attempts may be made to dissolve it by allowing the patient to drink liberally of a strong decoction of queen of the meadow, in combination with alkalies, or acids, according to the chemical nature of the calculi. If this cannot be done, it should be removed by lithotrity or lithotomy, as directed by Dr. Druitt.

Lithotrity. "Lithotrity is an operation for grinding or crushing stone in the bladder into fragments of so small a size that they may be readily expelled through the urethra.

The operation is performed as follows: The patient is placed on a couch with his pelvis well raised, and his shoulders comfortably supported; the bladder is then emptied, and five or six ounces of warm water injected with a proper catheter and syringe. The injection should be accomplished with the greatest possible slowness and gentleness. The instrument, warmed and oiled, is now to be most gently introduced; and it must be passed fully into the bladder. The next step is to seize the stone. But for this purpose, as is well and forcibly stated by Sir B. Brodie and Mr. Skey, it is not justifiable to move the instrument about in the bladder, or to use it as a searcher; on the contrary, as Mr. Skey says, the stone must be brought to the instrument. For this purpose, the blades having been opened, in doing which the same surgeon observes, the female blade should be pushed forwards to the same extent to which the male one is drawn back, the blades should be pressed downwards towards the rectum, by raising the handle; so that the bladder may assume a conical form with the apex downwards. Into this apex the stone will most probably fall; if not, a slight shake given to the patient's pelvis will probably make it do so.

When the stone is fairly grasped, the screw or other mechanical force employed should be made to crush it; and here the first operation should generally end, for the surgeon must adopt *festina lente* for his motto, and must not be eager to do too much at one sitting. At the close of the operation, it must be seen that the blades are entirely closed, and not choked by detritus; then the instrument is withdrawn. The subsequent parts of the treatment are these. First, all pain, which is often severe, must be allayed by

opium, administered by the mouth, or in the form of enema or suppository. Hip baths, barley water, and other demulcent drinks, and alkaline medicines, may be used with the same intention. *Secondly*, the operation must be repeated at intervals, till every fragment is crushed and expelled. In favorable cases there is some degree of scalding and pain, which soon passes off, and allows the operation to be repeated in three or four days. In less favorable cases, there may be severe pain and spasm of the bladder, requiring an interval of six or eight days.

The *third* point is the getting rid through the urethra of the detritus or fragments. After each operation, and especially after the first, the patient should not attempt to make water for some hours; and should remain quietly on his back for two or three days. Probably he will not be able to make water, from the injury which the neck of the bladder has received, and will require the catheter. After subsequent operations, the removal of the detritus may be promoted by injecting the bladder with warm water through a catheter with a large eye; or the catheter forceps may be used. It may be expedient to make the patient pass water on his knees, especially if the prostate be enlarged. If a fragment become impacted in the urethra and cause retention, it must either be gently pushed back into the bladder, or extracted by the urethra forceps, or by probe or hook; or crushed in the urethra; or lastly, be cut down upon from the perinæum.

Contra-indications.—The circumstances which render the operation of lithotrity difficult or dangerous relate to the *urethra;* for if this be naturally small, as in children, or strictured by disease, and incapable of being dilated so as to admit the necessary instruments, lithotomy is to be preferred to lithotrity. Unconquerable irritability and contractility of the *bladder*—especially if already thickened by disease. Very great enlargement of the *prostate*, and especially of the third lobe, which hinders the manipulation of the instrument and the escape of detritus. Great size of the stone, such as a greater diameter than two inches, especially if accompanied with great hardness, and if there are more than two stones. If these be the contra-indications, it will be readily inferred that the *Cases in which Lithotrity may be beneficially resorted to* are those in which the patient is an adult, with a full-sized *urethra;* in which

the *prostate* is not enlarged; or, at all events, in which, if the prostate be slightly enlarged, the stone is small, and other circumstances favorable; in which the *bladder* is free from thickening, extreme irritability, and *purulent* catarrh. Simple mucous catarrh is no contra-indication—in fact, being caused by the presence of stone, it will be relieved by that which removes its cause. Lastly, in which the stone is single, or in which, at least, there are not more than two, not large, nor very hard. The oxalic are the hardest and most intractable of all.

This operation may be followed by rigors and great constitutional disturbance and debility; or by inflammation and abscess in the pelvic areolar tissue, which may prove fatal. But Sir B. Brodie gives it as his opinion that, if prudently and carefully performed, with a due attention to minute circumstances, it is liable to smaller objections than almost any other of the capital operations in surgery. It must be observed, in conclusion, that the benefits of lithotrity are most fully evinced when patients apply for relief at the earliest possible period after the descent of the stone into the bladder.

STONE IN WOMEN.

Stone in women is much less frequent than it is in men, and when a renal calculus reaches the bladder, it is much more easily voided. If, however, there is a calculus too large to escape, it must be removed.

1. The surgeon may employ *lithotrity*.

2. The orifice of the urethra may be simply dilated, which may be effected by *Weiss' female dilator*, slowly or quickly, as may be desired.

3. The bladder may be cut into from the vagina, or the orifice may be incised.

4. Incision may be combined with dilatation. The great evil is the almost certainty that more or less incontinence of urine will follow. Mr. Fergusson recommends that the dilatation should be effected very slowly by means of a metallic or some other dilator, till it is capable of admitting the forefinger, when forceps may be introduced to seize the stone. If this should not answer, and it seems necessary to make an incision, he recommends that the anterior half of the urethra—not its whole length into the bladder—

should be divided to the extent of half an inch with a probe-pointed bistoury, after which sufficient dilatation might be effected with the forefinger oiled. The outer part of the urethra, which is the most undilatable part of it, would be alone divided by this operation, and the neck of the bladder, unless very roughly used, would speedily acquire its tone and use. In this way the eminent surgeon just quoted has extracted a stone three inches in circumference, and the patient had the power of retaining her urine immediately afterwards.

Medical Treatment.—The treatment of gravel should be governed by the nature of the case. If it be of an acid character, (which may be known by the urine turning blue litmus paper red,) lithontriptics, alkalies and diuretics should be given for the purpose of dissolving the stone and expelling it from the bladder or organ which contains it. For this purpose the following compound may be given:—Take queen of the meadow, pulv., one ounce; Indian hemp, two ounces; bicarb. of potassa or saleratus, one drachm; mix, make an infusion, and let the patient take one-half teacupful three or four times a day. Also, inject a teacupful into the bladder once a day, and after it is evacuated, inject it with warm flaxseed tea, to prevent irritation. For the purpose of facilitating the action of the diuretics, a podophyllin purge should be occasionally given. The patient should also be allowed to partake freely of vegetables, to prevent farther calcareous accumulations. If the calculus be alkaline in its chemical nature, (which may be known by the urine turning red litmus paper blue,) forty or fifty drops of nitro-muriatic or sulphuric acid may be added to the diuretic mixture instead of the saleratus, and administered as before. In addition to the above, I have used the *aralia hispida* or dwarf elder, cleavers, asparagus, horse-chestnut tree bark, the asarum canadensis, or colt's foot, &c. In all cases the diuretics should be mixed with acids or alkalies, according to the chemical character of the deposit. When these measures fail, the stone may be crushed in the bladder by means of an instrument called the lithontriptor. It will then be expelled with the urine. The operation of lithotomy should be performed by none but the most experienced surgeons.

CYSTITIS.

This disease, although rare, may be produced by various causes, such as wounds, gonorrhœa, the passage of instruments, irritation arising from applying blisters, etc.

The symptoms are, very great irritability in the bladder, pain and weight in the sides and lower part of the abdomen, etc. The urine is high-colored, frequently mixed with blood, mucus or pus.

Sometimes an attack of acute cystitis will terminate in the chronic form. When it terminates fatally, the symptoms will be of a nervous character, the pulse being rapid and weak, the tongue dry and dark, and the urine extremely offensive. After death, the disease will be found to have changed from inflammation of the bladder to inflammation of the peritonæum, or the formation of abscess.

The chronic form of cystitis is commonly called the irritable bladder, the symptoms of which are similar to those of the acute form, although less severe. It continues generally for a long time, usually terminating in vesicular catarrh. This form mostly occurs in men, and frequently involves other diseases of the urinary organs.

The symptoms of *vesical* catarrh are constitutional debility and local irritation, with a frequent desire to pass water, which is usually mixed with a quantity of mucus. Should the urine be left to stand, it will divide into two parts, the lower being a thick, gummy mucus, and having the appearance of pus, while the upper portion remains clear. The chronic form of this disease is frequently fatal, terminating, generally, with symptoms of typhoid fever.

On examination of the bladder, after death, the mucous membrane will be found very much thickened, the blood assuming a black color in the veins, which are very much enlarged. Abscesses will also be found, while the mucous membrane lies in folds, which become thick and hard. As the disease advances, the organs become covered with sacs, which are of two kinds. In the first, the muscular and mucous coats are pushed outwards. In the second, or most frequent form, the mucous coat only forms a protrusion like hernia. Pus, mucus, and sandy substances are frequently found in these cysts.

Children of a scrofulous nature are occasionally affected with a

peculiar form of chronic inflammation of the bladder. The child has frequent desires to make water, which occasions much pain, while the urine is exceedingly offensive. On sounding the bladder, it will be found rough, and containing mucus and a grinding or sandy matter. Sometimes the presence of worms is noticed.

Irritability of the bladder frequently occurs in women, and resembles stone so closely that it requires the most careful investigation to detect the difference. It appears to depend on a diseased and extremely sensitive state of the mucous membrane of the bladder and urethra. In some cases it appears to be dependent upon a disease of the genito-urinary organs, or an affection of the uterus. Prolapsus of the anterior wall of the vagina will also keep up this state.

Treatment.—In addition to the treatment general for cystitis, populin and gelsemin will be found valuable remedies. Populin exerts a most tonic and invigorating influence over the mucous membrane of the bladder, ureters and urethra. Hence, in all cases where there is a weak or ulcerated condition of the mucous membrane of the bladder, from one to five grains of populin should be given three or four times a day, and if there be difficulty in voiding urine, with pain and sensation in the bladder, from one-eighth to one-fourth of a grain of gelsemin may be given with each dose of populin. If there are gravelly deposits in the bladder, one or two grains of eupatorium purpurin should be given two or three times a day. Warm irrigation of the bladder by means of a double canula may also prove beneficial where there is chronic inflammation. In diseases of the bladder of a chronic character, quinine, in combination with gelsemin or populin, may also prove beneficial. Mecca oil and the essential tincture of hydrangea are remedies of great value.

ISCHURIA, RETENTION OF URINE.

In this disease, the urine, accumulated in the bladder, cannot be evacuated except with extreme difficulty, or without assistance; when it cannot be evacuated without assistance, the retention is said to be complete; and when it is evacuated without assistance, but with great difficulty, it is said to be incomplete.

Causes.—The causes of retention of urine are various; as in-

flammation of the bladder, small stones or gravel lodging in the urinary passages, hard fæces lying in the rectum, pregnancy, stricture of the neck of the bladder, swelling of the hemorrhoidal veins, paralysis of the bladder, prolapsus uteri, and inflammation of the mucous surface of the urethra. It also occurs in hysteria, and from inflammation of the meatus urinarius.

Symptoms.—When the bladder becomes abnormally distended with urine, there will be a dull pain in the back, with sharp, lancinating pains passing through the bladder. As the accumulation of urine goes on, the pain increases until it becomes excruciating, the arterial system is much excited, and the pulse beats with increased frequency, rising to 100 or 140 beats per minute. The respiration is hurried, and the skin hot and dry. If the uric acid be allowed to be absorbed into the blood, the brain will sympathize with the other constitutional symptoms, producing delirium, and as I have seen in several cases, clonics pasms. Unless the bladder be evacuated, it will become perforated, producing death; or death may occur as the result of zymotic influence upon the blood and nerves.

Treatment.—When the retention is dependent upon inflammation of the bladder, kidneys, or urethra, the bladder should first be evacuated by means of a catheter; after which the disease should be treated, as directed under the head of inflammation of these parts. If it depends upon a stricture, it can generally be overcome by injecting into the urethra a solution of the extract of belladonna or gelseminum:—Take extract of belladonna, ten grains; warm water, three ounces. Dissolve the extract in the water, and inject one-third into the urethra. If this be not soon followed by relief, it may be repeated every fifteen or twenty minutes. If, in a reasonable time, relief be not effected, the ext. gelseminum may be used in the same manner. In my hands, this treatment in stricture of the urethra has proved efficacious in a large number of cases. When this fails, small bougies at first, but gradually increased in size, should be introduced into the urethra. Where the disease is occasioned by a gravelly deposit in the bladder,—Take eupurpurin, thirty grains; cream of tartar, one dram; apocynin, twenty grains. Mix, triturate; divide into ten powders, and give one three times a day, in one teaspoonful of syrup of iodide of

potassium. Where there is pressure on the neck of the bladder, by fæces lying in the rectum, by pregnancy, or other cause, it should be removed. And then, by the use of marshmallow, cleavers, or flaxseed tea, a cure may be effected. In females, where it is dependent upon irritation of the meatus urinarius, a warm elm poultice, applied to the vulva, and lemon-seed tea, will generally effect a cure. If there should be debility of the bladder, with a tendency to paralysis, tonics, combined with iron, should be used, and the nerves of the back gently stimulated by the application of the electro-magnetic current once or twice a day. During the treatment of retention of urine, whatever the cause may be, the bladder should be evacuated every day by the use of the catheter.

ENURESIS, INCONTINENCE OF URINE.

Incontinence of urine, like retention, is often associated with some constitutional weakness. In advanced life it is usually associated with disease of the neck of the bladder, prostate gland, or with paralysis. Incontinence of urine, in children, mostly occurs in the night only, while asleep; and, not unfrequently, in these cases the urine passes off involuntarily under the influence of a dream. It is said that in such cases the acid property of the urine is the exciting cause, and that there is a strong tendency to gravelly deposits. In young people, where the urine passes off in the night involuntarily, it is usually retained, at any time, with much difficulty, and will be of a very pale color, and far less serous than is natural. In old people, this difficulty arises from paralysis, produced by injuries of the spine, or over-distention of the bladder, injuries of the neck of the bladder, &c.

Treatment.—In children, where the disease depends upon a changed condition of the urine, the diet should be well regulated, and warm or cold baths given three or four times a week. A syrup of equal parts of hydrastis canadensis, and aletris farinosa, should be given in teaspoonful doses three times a day. When it depends upon spinal irritation, the irritating plaster should be applied to the spine, and from five to ten drops of the oil of erigeron given three times a day, with a free use of cold baths and friction.

If the bladder be in an irritable state, give the following:—Take

dwarf elder, one ounce; Indian hemp, two drams; marshmallow, one ounce. Make one pint of syrup, and add one half pint of gin. Dose, one tablespoonful three times a day. If there be an enlarged condition of the prostate gland, one dram of iodide of potassium should be added to the syrup, and the same quantity taken. One drop of the tincture of belladonna, taken three times a day, has cured the disease in a few cases. Tincture of gelsemin may be given in the same way.

PARALYSIS OF THE BLADDER.

If the body of the bladder be paralyzed, the patient will be affected with retention of urine, on account of the want of power in the organ to throw off the contents, not because of any obstacle to the flow of the urine. When paralysis occurs in the neck of the bladder, the urine passes away without the will of the patient.

Loss of tone in the body of the bladder, found in old persons, is simply occasioned by the want of muscular power, or as an effect of fever.

When occurring as the result of disease, the urine escapes in a dribbling manner, while the patient finds it difficult to evacuate the bladder completely. Should entire retention occur, the bladder generally enlarges, extending into the hypogastric region, often as high as the umbilicus. On examination, the lower portion of the abdomen will be found hard, rounded, pear-shaped, and elastic, having the feel of an enlarged uterus. On percussion, a dull sound will be heard; while, by tapping above the pubes with the fingers, fluctuation may easily be perceived. When the bladder has become distended, a quantity of water constantly dribbles away, thus causing a large amount to pass off, but which does not relieve the retention. This affection is much more common in men than in women. The bladder sometimes increases to such a size as to lead to the supposition of the presence of a tumor, the surgeon even resorting to tapping.

Retention of urine from paralysis, may be distinguished from retention from obstruction, by noticing, on the introduction of the catheter, (the patient being placed on his back,) that the instrument may be passed in very easily. In retention, also, the urine that escapes will be very high-colored. Should the disease con-

tinue a long time, the consequences are likely to prove fatal. Subacute inflammation occurs, followed by typhoid symptoms; and even if the retention be relieved, this state is liable to be present. The constant dribbling prevents the ulceration or bursting of the bladder, when the retention occurs from paralysis, without any obstacle being present.

A weakness of the neck of the bladder will give rise to *incontinence of urine*, because there is not sufficient strength to retain the contents of that organ. It may result from various causes, being most frequent in children. It may occur in old people as the effect of debility, and is usually accompanied by retention. It is frequently dependent upon other affections, and sometimes upon nervousness. It is most liable to be found in children of a scrofulous nature.

Hysterical retention and *incontinence* may be observed very often in girls of a nervous temperament. In hysterical retention the frequent use of the catheter is not advisable, as the patient is apt to depend entirely upon this for the removal of urine.

The bladder is frequently affected with severe pain when no disease can be discovered, even upon close examination: the pain will be neuralgic, or else depending upon the disease of some other organ not connected with it. It must be remembered, however, that irritating urine, or the secretion of urine, will, in some persons, occasion much suffering, and any disease coming in contact with the neck of the bladder will cause frequent desires to micturate.

We sometimes find the anterior wall of the bladder absent, together with a deficiency in the corresponding wall of the abdomen. In such cases the pressure of the abdominal viscera behind forces the posterior wall of the bladder forwards, causing the formation of a small, rounded tumor, the surface of which is red, and papillated, and apparently formed of mucous membrane.

Treatment.—In paralysis of the bladder, strychnin, viburnin, and electricity, together with cystic tonics, such as populin and helonin, will be found most reliable remedies. I have succeeded in curing several cases of paralysis of the bladder, by giving one-sixteenth of a grain of strychnin, four or five times a day, and passing gentle currents of electricity through the bladder twice a day. This treatment should be followed by small doses of populin, viburnin, and

helonin. The integrity of the system should be protected by general tonics, baths, and nutritious diet; Mecca oil, and stimulating liniments to the spine.

URINARY FEVER.

Retention of Urine is a term that includes things as different from each other according to their cause and state, as any disease you can imagine. It is said, there may be retention of urine in the pelvis of the kidney, in the ureter, in the bladder, and in the urethra. In the first two cases, we, in the first place, are in want of symptoms to point out their existence distinctly; and in the next instance, if we knew perfectly well what was going forward, we could do nothing for the sufferer. There are many causes for the retention of urine in the bladder, very different in their nature, and requiring very different treatment, when any can avail. Retention of urine may exist in the kidneys and ureter as a consequence of retention in the bladder;—an unfortunate patient dying of cancer of the uterus, may have these additions to her sufferings, from pressure on the bladder or on the ureters themselves. An abscess in perinæum may press on the neck of the bladder, and cause retention of urine: the patient, in such a case, may not have made water for two or three days, and yet the surgeon not hear any complaint of a want to make water, or any observation at all upon the subject, unless he happen to ask the question; but generally when you lay open the abscess, and evacuate the matter, which in some cases is in considerable quantity, the bladder will act itself, and discharge its contents, without leaving behind any tendency to a return of the retention. Such a case will sometimes give more trouble. In like manner tumors forming in the pelvis may cause retention of urine from their pressure.

Morbid growths in the cavity of the bladder itself, or enlargements of natural structures, as the uvula of the bladder, as also calculi and inflammation of the coats of the bladder, may be the cause of the retention of urine. The bladder may be unable to expel its urine from some fault in the organ itself. Thus, suppose a man fall from a height, and receive a hurt in his spine, paralysis of his lower extremities follows, and the bladder partakes in the paralytic affection: here, if we lay our hand over the region of the

bladder above the pubis, we feel the tumor caused by its distention, and all we have to do is, to introduce a catheter, draw off the urine, and repeat this every six or eight hours to afford temporary relief, and reprieve the patient for a short time; but such a case will never recover—he will die in from eight to ten weeks. There is another cause of retention of urine caused by the condition of the bladder itself. A man advanced in years, of studious and sedentary pursuits, and a full habit of body, comes to you and tells you that he has to get up very often during the night to make water, that he passes but little at each time, and is obliged to make much effort to get away that little. Such men will often tell you, that after these efforts, they had still the impression they had not entirely emptied the bladder; they had not the comfort usual in evacuating a distended bladder, and that they experienced some pain in their straining to pass more; by and by, this man finds he cannot make any water at all. Now, this is a case where the bladder is in a less *sensible state* than natural; there is no inflammation whatever in it. The first time the patient finds he cannot pass his urine is generally after a long sleep. Sometimes he will remain five or six hours without being able to pass any, but will not send for a surgeon, and after this it will begin to come away; not, however, in a full stream, but dribbling, what is called *stillicidium urinal;* yet, as in in this way he makes quite as much urine in the twenty-four hours as if it came naturally, neither he nor his friends imagine there is such a thing as retention in the case. Suppose the man, say seventy years of age—has suffered very little pain or trouble from the distention of the bladder—he sends for you, and when you arrive, he tells you he has got an unpleasant complaint, that he can't keep his water, and just requests you to stop this constant passing of it, and that then he will be quite well; yet this patient, if not relieved of the retention, will have his constitution affected with urinary fever; he gets a somewhat severe rigor; he then gets into the hot fit, which lasts about half an hour; this is followed by the sweating stage, which is extremely profuse, and may last for hours. It is not a partial sweat, but general over the whole body, and although he throws off the bed-clothes, he will be obliged to change his shirt several times in the night—in fact, he lies in a kind of warm bath all night, and sheets, bed, and all are

drenched. If a second attack of this fever come on, there will be some difference discernible in it from what you observed at first. In the previous attack the skin of the patient *felt cold* to the hand of an examiner, while the patient was shivering, but the second time, while the patient himself feels excessively cold, the skin feels hot to the hand of another person: it goes on, his head becomes affected, and off he goes. This urinary fever is a true intermittent, and so strongly does it resemble common ague, that if you were to come in during a paroxysm, you might readily mistake one for the other; but the paroxysms of the urinary fever are very irregular in their periods of return: in this it essentially differs from ague, and by it could always be distinguished readily. Now, you read that a patient laboring under this fever has a urinous smell from the skin, or even his breath; but there is no truth whatever in this: the constant dribbling of urine wets every thing about him, and diffuses the urinous odor, throughout the whole house, perhaps, but I never observed a urinous smell, except where urine was coming away in this manner. Some lighter shades of this fever will attend lighter degrees of urinary disease, or they might be considered as premonitory symptoms that may or may not eventually end in the severer form; but, at all events, will show a disposition in the patient to become affected. He will be chilly without any very apparent cause; his skin will feel constricted and rough; he will dread any exposure to a north-east wind, or even to get between the cold sheets at night; and will have his bed warmed, yet he may not have any thing like a regular rigor.

Treatment.—The patient should have a warm bath and a small dose of aconite, say one or two drops in a little warm water every half hour. After the warm bath, hot packs should be applied on the lower abdomen, and changed as often as every half hour. Also give the following compound:—Take barosmin, ten grains; quinine, six grains; eupatorium purpurin, ten grains; sacch. alba, one dram. Mix. Make 12 powders. Dose, one every two hours. The bladder should also be evacuated with the catheter as often as once in ten or twelve hours. There is a cause of retention which you must carefully distinguish from the last, in which all you had to do was to draw off the urine, and administer a mild treatment. In this case a single introduction of the instrument does permanent or irreparable

injury. It is this: an old man finds he has repeated calls to make water; at each time he goes to the utensil, he has to force himself, and in the exertion, experiences some pain; he passes only a spoonful or two at each offer, and feels satisfied. You lay your hand over the pubis, but there is no tumor there, perhaps, although you may think you can perceive it; for there may be retention of urine, and yet the bladder be so contracted that it cannot be felt externally. Here, if you once introduce a catheter, that man never makes water again without the aid of one: he must, as long as he lives, use a catheter to empty his bladder. The treatment for such a case consists in rest, and a free use of queen of the meadow in infusion. If that does not remove the difficulty, apply hot packs over the abdomen, and give freely of barosmin, say one or two grains every two or three hours. There is another kind of retention of urine. A man for two or three years, perhaps, perceives that he makes water more frequently than his neighbors. He has been in the habit of indulging in wine or punch, or something of that kind: now, if on some occasion, when he wants to make water, he neglects the call of nature, being, perhaps, loath to leave his liquor or his company, he will get retention of urine. He goes home, suppose, after drinking a good deal, and after, as I said, neglecting the call of nature before, during the evening, he now tries to pass water before he goes to bed, but cannot pass a drop. He does not mind this, however, but goes to bed, and awakes with *great pain* in the region of the bladder. An irritable bladder will get retention in the same way: the man is, perhaps, in a court of justice, and cannot get out when he wants to make water. In these cases you must use the catheter without any delay;—you have nothing else for it. What position is the best to put your patient in for the introduction of the catheter? Wherever you can, make him lie on his back; for so many patients faint as the water is coming away, he may fall over you, if you put him in an erect position; and besides this, you have him favorably situated to introduce your finger into the rectum, if it should be required, which is often the case. You should seize every opportunity that comes across you to practise the introduction of the catheter into the bladder: there is nothing in practice more likely to turn out of greater importance to yourself and others, than dexterity in this operation, and this is not to be obtained with-

out that practical education of your hand which your opportunities may daily furnish you the means of accomplishing, if you sufficiently appreciate the necessity. Your anatomical knowledge of the urethra will do something; your passing a sound or bougie in the dead body will add something; but nothing will make you feel steady and dexterous but the frequent practice on the urethra of the living man. When you are introducing an inflexible instrument, then carefully keep the open end in the middle line, and close to the belly, and draw the penis upon the instrument. I may just mention that the secret of introducing the long instrument, called Home's catheter, is, to introduce it far before you begin to turn it. Should the point of the instrument meet an obstruction, it may only have hitched against the triangular ligament of the urethra alone, and this circumstance you can know by the simple contrivance of letting your fingers relax on the instrument, and it will make a half turn or circle of itself, if it be impeded by the ligament.

The catheter is often stopped at the commencement of the membranous part, and may be thrust through the bulb. There is nothing in all surgery so material as being able to introduce the catheter well. As to using force, you will not have to use it in one case out of fifty in the introduction of a catheter. Force should never be used when the urethra is sound. Spasm is mentioned as one of the causes of resistance to the introduction of the catheter, and it is useful to keep up that notion, as we cannot sometimes succeed in passing the instrument when we most wish to do so, and this without our well knowing why. In such a case, we may lay the blame on spasm; but, for my own part, I have always felt more resistance from spasm in *withdrawing* than in *introducing* an instrument into the bladder. I have sometimes certainly found considerable difficulty in introducing a bougie or catheter, and by using gentle friction on the perineum, and waiting a little, the instrument has glided in easily, and this in a large urethra; but such a case as this I do not meet with once in a year. After the introduction of the catheter, it will often happen that a rigor comes on, but it must not be imagined that it is always an immediate, or even a very quickly succeeding result. No, the rigor may come on in half an hour, or in twelve hours, or even not for forty-eight after the introduction; and from the length of time which has elapsed, the catheter is often

not supposed to be the cause; but it is, notwithstanding. This occurrence happens in patients with an irritable bladder, or who have been previously the subject of some disease of the urinary organs. To prevent the recurrence of this rigor, keep your patient quiet, and give him a *full* anodyne draught. Urinary fever is one of the dangerous effects that may arise from the introduction of a catheter: we shall, however, defer saying more of urinary fever at present.

Bleeding from the urethra is sometimes a consequence of the introduction of a catheter, even when it is done in the best manner, and without violence. When you first withdraw the instrument from a canal disposed to bleed in this manner, there comes a little blood, which ceases by degrees, and a coagulum forms in the urethra; the next time the patient goes to make water, he finds great difficulty in passing any, but after straining some time, he expels the coagulum, and then comes on the bleeding again. Sir E. Home tells us not to make compression on the urethra to stop this bleeding; because, if you prevent the blood coming out, it will flow into the bladder. Now, you are to pay no attention to this doctrine, but do the very reverse of what it would inculcate. The blood has never been known to go backwards into the bladder, under the circumstances we are considering. There is no use whatever in giving such a patient large quantities of spirits of turpentine, acids, and other things supposed to have the property of stopping hemorrhage, but which often injure the stomachs of those made to swallow them. You must compress the urethra in this way: get a napkin and roll it up hard, put it between the patient's thighs, and press it up against the perinæum for ten minutes, and the bleeding stops; but this, however, is not without its inconvenience, for the next time the patient goes to make water, he cannot pass a drop at all. This arises from a coagulum which has formed in the urethra, and the patient, with some straining, at length expels it, and the inconvenience is removed. If, after compressing the urethra and stopping the hemorrhage, it should return, when the coagulum is removed, from five to ten drops of the oil of erigeron should be given every half hour. Or the bladder may be injected with a mild decoction of matico or geranin.

SPASM OF THE BLADDER.

This condition is characterized by violent pain at the lower part of the abdomen, and along the urethra to the extremity of the penis. The urine may be passed involuntarily, though usually it is retained, there being a disposition to micturate frequently, without the power to do so. Frequently, also, there is tenesmus and erection of the penis. During the paroxysm, the patient may be affected with cold perspiration, pallor of the surface, feeble pulse, great restlessness and general distress; or, the spasm may be less violent and continuous, and the affection altogether much more moderate. It is distinguished from cystitis by the absence of fever, of pain on pressure, and its paroxysmal character. When the spasm is of long continuance, death may result with all the symptoms of suppression of the urine. In these cases, the vesical extremities of the ureters have been found spasmodically closed; while the tubes themselves have been dilated by the accumulated urine; the increased dilatation occasionally extending to the pelvis of each kidney.

Causes.—Spasm of the bladder may proceed from calculi, malignant vesical tumors, diseases of the rectum and uterus, abnormal renal secretion, gout, a morbid increase of acid urine, as in rheumatism, abscess of the kidney, ulceration, or other organic affections of the bladder, prostate gland, etc.; irritation of diuretics, as cantharides, exposure to severe cold, hysteria, excessive venery, and intestinal disorders.

Treatment.—Five drops of the tincture of gelseminum and ten of lobelia, administered every five or ten minutes, will arrest the disease at once. A hot pack may be applied over the bladder at the same time. An injection of starch-water, containing one-half ounce of lobelia tincture, will have the same effect.

TUMORS OF THE BLADDER.

Fungous growths, or tumors of various shapes, are sometimes found in the bladder. They may occur at any time of life, and generally occasion a great deal of irritation in the organ, giving rise to retention of urine and some symptoms of stone. The growths are usually of a malignant character, and generally con-

nected with like affections of the prostate. In women they may be closely allied to cancer of the uterus. These tumors are sometimes found covered with earthy concretions which somewhat resemble a calculus, but from which they may be recognized by the impossibility of passing the sound around them.

Treatment.—Benefit may be derived in these cases by the liberal use of iodide of ammonia in combination with compound syrup of stillingia, populin, &c. Where there is much pain and irritation connected with these affections, hyoscyamin and gelsemin, given in small doses, will afford relief.

DISEASES OF THE PROSTATE.

The prostate may be the seat of various affections, as hypertrophy, the formation of calculi, acute and chronic inflammation, and scirrhus.

Inflammation of the prostate is generally the result of gonorrhœa, usually past the ages of twenty-five or thirty, and most frequently in men of middle age. The symptoms are, a frequent desire to urinate, which act is accompanied with severe pain, heat, and weight in the perinæum. On introducing the finger into the rectum, the gland will be discovered very much increased in size, and extremely sensitive to the touch.

Abscess of the prostate may be caused by acute inflammation, or it may occur when very little inflammation precedes the affection. Idiopathic suppuration of the prostate rarely occurs.

When abscess is a consequence of inflammation of the prostate, it is accompanied by retention of urine, throbbing, and rigors. The abscess frequently gives way into the urethra, but it has been known to open externally into the rectum or through the perinæum. Frequently, during the introduction of the catheter, the abscess will burst, the matter escaping through the instrument.

Retention may occur, in prostatitis, from the formation of pus, or from the swelling of the gland.

Chronic, or *sub-acute inflammation* of the prostate, frequently happens in persons of debilitated constitutions; or it may be the result of gonorrhœa, or local irritation. We find in this affection pain in the gland, heat, and tenderness, with a discharge of a thick, ropy mucus, frequently misjudged to be spermatorrhœa. Its con-

tinuance occasions a great deal of irritation of the neck of the bladder, together with debility of the generative organs.

Hypertrophy of the Prostate.—This disease is generally met with after the age of fifty—very rarely before. When the hair becomes gray, and when atheroma is found in the coats of the arteries, the size of the prostate is always enlarged; then the urethra becomes dilated, and the bladder thickened. It may be produced by any constant irritation of the urinary organs.

The enlargement of the prostate is chiefly dependent upon fatty degeneration of the gland; the degeneration of which may occupy the entire gland, or it may be confined to the lateral lobes. When the prostate is enlarged, the corresponding portion of the urethra also becomes larger than usual. The middle lobe of the prostate may be increased in size, while the lateral lobes retain their normal bulk. These enlargements render it very inconvenient in attempting to pass water, and may cause retention or incontinence. The symptoms of this disease are, a straining before evacuating the bladder, and, after an apparently full passage, an involuntary escape of water in small quantities. The patient is also much longer in evacuating the bladder than is usual. The urine becomes fetid and mixed with mucus.

Retention of urine generally makes its appearance gradually. The patient will find much difficulty, some time previously, in passing water, while the greater the effort he makes the more difficulty he experiences in accomplishing it. When the bladder becomes expanded with urine, a small quantity will escape, until the parts about the neck of the prostate relax and allow it to pass.

Treatment.—Where there is acute inflammation of the prostate, the bowels should be opened with small doses of jalapin and cream of tartar; after which the patient should be put upon full doses of veratrum viride, and the impression maintained until the inflammation is subdued. During the treatment the patient should be kept quiet, and the penis, scrotum, and lower portion of the bowels constantly packed in warm water. If the inflammation be of a chronic character, a small irritating plaster should be applied to the perinæum, and small doses of podophyllin and irisin given four or five times a day. The quantity of podophyllin given should be sufficient to maintain a mild alterative action on the sys-

tem, but not sufficient to produce purging. If this should not succeed in subduing the inflammation, one or two warm sitz-baths should be given every day. Where there is hypertrophy of the gland, and there is irritable urine caused by an excess of acids, eupatorium purpureum, barosmin, in combination with alkalies, should be freely used. If there is retention of urine, the bladder should be evacuated by means of a catheter. The enlargement of the gland can usually be reduced with compound syrup of stillingia and iodide of ammonia. Take compound syrup of stillingia, six ounces; iodide of ammonia, one dram; mix, and let the patient take one teaspoonful five or six times a day. In some cases I have found benefit from painting the lower portion of the urethra and perinæum with the tincture of iodine. If the enlargement of the gland obstructs the urinary passage, sulphate of sanguinaria may be applied by means of Lallemand's porte-caustique; in other cases nitrate of silver may be applied with the same instrument, and the prostatic portion of the urethra thoroughly cauterized. Phytolaccin, corydalin, iodide of potassium, sitz-baths, electricity, and iodine have also been used in chronic enlargement of the prostate to advantage.

SUPRA-RENAL CACHEXIA.

The supra-renal capsules have for a long time attracted the general interest of the anatomist and pathologist; for, though they probably perform some important office in the animal economy, yet at present the exact nature of their functions, or the manner in which they perform them, cannot even be surmised. The obscurity which surrounds these organs has not been dispelled by the discovery of Dr. Addison, that certain examples of severe anæmia, with a peculiar discoloration of the skin, are due to, or at least accompanied by disease of these capsules. Having noticed various instances of a peculiar discoloration of the skin, connected with an anæmic or cachectic state of the system, and presenting certain prominent characteristics, which will be described presently, which generally terminated fatally, and having, on post-mortem examination, found, as a constant attendant on these phenomena, some organic lesion of the supra-renal capsules, frequently without any other lesion, he gradually seems to have imagined that the fault existed in these capsules, and felt justified in considering these several morbid con-

ditions as having an essential connection, and as constituting a distinct affection.

Symptoms.—As in most cases of anæmia, so in this form, the complaint usually commences almost imperceptibly, and is very slow in its approach. The symptoms are languor, weakness, a small and feeble, and perhaps rapid pulse, impaired appetite, an irritable stomach, with, perhaps, nausea and vomiting, faintness on the least exertion, pain in the epigastrium, shooting through to the space between the scapulæ, a pearly white appearance of the conjunctiva, constipation, aching in the back and loins, emaciation, while occasionally there are indications of cerebral disturbance, as loss of memory, a feeling of numbness, and even convulsions. With all, or most of these symptoms, for which no adequate cause can be found, except disease of the supra-renal capsules, Dr. Addison supposed that a gradual discoloration took place in the skin, strongly manifested on the face, neck, superior extremities, penis, scrotum, axilla, and around the navel. The discoloration, at first, is of a dingy or smoky hue, but darkening into some shade of deep amber, or chestnut brown. When it is uniformly diffused, the patient, though white before, might be mistaken for a mulatto. Black stains on the lips constitute an important diagnostic character. Occasionally typhoid symptoms precede death, and sometimes convulsions. In only one of Dr. Addison's recorded cases, does the blood seem to have been examined microscopically, in which case a considerable excess of white corpuscles—leucocythemia—was found to exist.

Since, however, the publication of his researches, cases of renal capsular disease have been recorded, where no discoloration of the skin had existed during life. It is now believed that the discoloration is not an essential element of the affection, for it appears to exist only when the case is of long duration; while, when present, it complicates the entire surface of the body, though more marked in some parts than others. But, again, it is certain that there may be the most extensive pigment deposit in the rete mucosum, without the slightest trace of disease in the supra-renal capsules.

The capsules may suffer from various forms of disease. Occasionally they are destroyed by some adventitious deposit; again, there may be atrophy of one organ, with hypertrophy and softening of the others: sometimes there is a tuberculous deposit in one, and

a collection of pus in the others. In other instances, there have been fatty degeneration, sanguineous engorgement, and apoplexy. Dr. Bennett remarks that there are numerous cases on record, where there were a bronzed appearance of the skin, and other discolorations, as recorded by Dr. Addison, and yet, upon making post-mortem examinations, no disease of the supra-renal capsules existed. He records a case of pulmonary phthisis, where extensive tuberculous infiltration into the capsules existed, without any discoloration, or any other symptom of the Addison disease. Dr. Harley has performed many operations upon animals, and removed the capsules, without, as he thinks, affecting the health. From all the observations made relative to this disease, we must come to the conclusion that disorders of the supra-renal capsules, under certain circumstances, may favor pigmentary degeneration, and its accumulation in the rete; and that pigmentary deposits may also occur as the result of other pathological conditions.

Treatment.—The treatment of this affection should be such as will give tone and energy to the body. One dram of the fluid extract of hydrangea, and two or three grains of sulphite of soda, may be given three or four times a day. Mecca oil, in ten or fifteen drop doses, will also be valuable. The tonic tea, tinctured in wine with iron, should be used to enrich the blood, and ammonia and barosmin given, to prevent the accumulation of urea in the system.

SECTION XIII.

DISEASES OF FEMALES.

DISEASES OF THE VULVA.

Inflammation of the Vulva.—Any part of the external organs of generation may be the seat of inflammation, which may be superficial, affecting only the skin and mucous membrane; or severe, involving the skin and sub-cutaneous tissues. The different forms of inflammation which may attack the vulva, are as follows:

Simple Vulvitis.—This form is characterized by redness and slight tumefaction of the skin, covered with mucus; while in neglected cases, the parts are found much excoriated. It generally arises from a want of cleanliness, or from the acrid character of the vaginal and uterine secretions. It may, however, be produced by excessive sexual intercourse, or a venereal taint. The *symptoms* consist of great pain and tenderness, a mucous discharge, ardor urinæ, and a constant aching about the loins and thighs.

Gangrenous Vulvitis.—Gangrenous inflammation of the vulva has occurred several times in an epidemic form in Paris. It appeared in puerperal women about three days after delivery, commencing with vomiting and diarrhœa; or with fever and abdominal pains; or with slight hemorrhage; which were soon followed by prostration, anxiety, and an œdematous appearance of the vulva. In the greater number of cases, pultaceous plates formed on the surface of the vagina and vulva, adhering closely to the mucous membrane.

Follicular Vulvitis.—This form has its seat in the sebaceous follicles of the mucous membrane of the vulva, affecting usually both sides of the vaginal entrance, the nymphæ, and the base of the clitoris. The parts are more or less inflamed, and studded with raised vascular points, occasionally being ulcerated at their summits. The points, after a time, coalesce, forming a strip of highly injected mucous membrane, while, at a later period, the tissues look as if they were covered with white paint. The symptoms characteristic of this obstinate and painful form of inflammation, are considerable disturbance of the general health, anorexia, despondency, constriction of the sphincter vaginæ, leucorrhœa, irritation and smarting of the genitals, pains in the back and thighs, and occasionally prurigo. It may occur at any time after puberty, though it is most frequent during pregnancy, and at "the change of life."

Erythematous Inflammation of the Vulva arises from a want of cleanliness, and is characterized by an eruption of a bright red color, giving rise to a sensation of heat and uneasiness. It soon spreads to the upper and inner surface of the thighs, and if it exists for any great length of time, *erysipelatous* inflammation of the part may ensue.

Infantile Leucorrhœa.—Infantile leucorrhœa consists of a discharge from the mucous glands of the vulva, producing itching, tenderness, difficult micturition, erythema of the vaginal labia; and sometimes the formation of ulcers within the vagina. The irritation produced by the eruption and discharge, causes the child to frequently rub and scratch herself, and thus excoriations are produced. The general health is much enfeebled, the child is badly fed or does not properly assimilate her food, the nights are restless, and occasionally some of the cervical glands are swollen, or there are other marks of the strumous diathesis.

Diphtheritis Vulvitis is characterized by the formation of tough, false membranes upon the inner surface of the labia, resembling those occurring upon the fauces in true diphtheria.

Treatment.—Inflammation of the vulva should be treated with hot packs, elm poultices, and a wash of a weak solution of sulphate of zinc as topical applications, and quinine, iron, macrotin, leptandrin, and cod liver oil, as constitutional remedies. In case of gan-

grene, lint, saturated in equal parts of compound tincture of myrrh, and a solution of sulphate of zinc, should be applied, and quinine and muriatic tincture of iron given internally.

Hypertrophy of the Labia.—This condition sometimes occurs, affecting the nymphæ, and frequently the skin and areolar tissue of the labia majora. It generally commences on one side. In very rare instances, the enlargement has been of such an enormous extent as to constitute a form of elephantiasis.

Treatment.—The parts should be painted once a day with the tincture of iodine, and compound syrup of stillingia and iodide of potassium administered internally.

Abscess of the Labia.—The part affected in this condition is characterized by a throbbing pain, which prevents the patient from walking or sitting without experiencing much suffering. There is also considerable heat and swelling, and much constitutional derangement. The inflammation occasionally commences in the vulvo-vaginal glands, the tissues of the labium becoming involved as the process of suppuration progresses.

Causes.—It is caused usually by inflammation from injuries; by forcible, or perhaps excessive sexual intercourse; or by a gonorrhœal and leucorrhœal discharge.

Treatment.—The abscess should be opened, and a slippery elm poultice applied, kept constantly moistened in the tincture of lobelia.

Cohesion of the Labia.—This may be congenital, or the result of accidental disorders. The cohesion is seldom complete; a passage sufficient for the urine generally exists. Sometimes, though rarely, complete cohesion exists at birth.

Causes.—Acute inflammation of the vulva is caused by severe labor, a burn, a venereal affection, a wound or laceration, or any other cause producing inflammation of the labia.

Diagnosis.—Where the cohesion is partial and near the posterior commissure of the vulva, there is an accumulation of urine and other discharges at that point, which, if suffered to remain, may produce ulceration, fistula, etc.

Treatment.—Carefully separate the labia by dissection, and subdue the inflammation.

Tumors of the Labia.—Encysted tumors of the labia are usually circumscribed and tense, forming a round or oval projection from the vulva, and being often semi-transparent. Some are as large as a partridge's egg; others are said to be as large or larger than a goose egg. The contents of the cyst are sometimes a yellow serum; at others, a viscid fluid, a dark-colored puriform matter, or a semi-solid lardaceous matter; the cavity is always lined with a distinct secreting membrane, the proper cyst-wall. These tumors may remain for years, and give the patient but little uneasiness. When large, they cause disturbance, by the tension of the parts. They rarely produce pain, unless by aggravating adjacent organs. *Fatty* tumors are also sometimes observed in the same situations.

Diagnosis.—Tumors differ from phlegmonous inflammation by their slow growth, and the absence of pain, heat, and redness. It is unlike œdema in its circumscribed form, being confined to one labium, and by its slow growth. It is unlike hernia in the following respects:—It swells and distends while coughing, and cannot be returned into the abdomen. To remove doubt, the exploring needle may be used.

Treatment.—The tumor should be thoroughly cauterized with caustic potassæ, and the parts covered with a slippery elm poultice. The constitutional treatment should be according to the symptoms presented.

Oozing Tumors may arise in one or both labia, and sometimes extend to the *mons veneris;* or cover nearly the entire labia. It projects from a line or two to one-third of an inch above the plane of the surrounding skin. The surface consists of slight depressions and eminences from which the liquor oozes in the form of a watery fluid, and forms drops which run off and keep the surrounding parts wet. The adjacent parts are sometimes œdematous, though œdema is not found in the tumor. The tumor increases in size, until the quantity of fluid is such as to cause much pain to the neighboring parts by its irritation in constantly passing over them. Thus, there are smarting and shooting pains on the inside of the labium, with a general sense of heat of the external organs, and pain and heat in passing water.

Treatment.—Apply to the tumor the mild zinc ointment; if that

should not remove it, cauterize it, and apply poultices as in the encysted form.

Thrombus, or Sanguineous Tumors. — These consist in extravasation of blood into the cellular tissue of the labia, and are caused by a rupture of some of the vessels of the parts, generally the veins. They are an accompaniment of parturition, and occur previously to delivery, during labor, or immediately after confinement. One or both labia may be affected; the tumor may extend upwards into the pelvis, or downward to the perinæum; the size depends upon the distensibility of the tissues: it sometimes becomes as large as a child's head; it is irregular, and of a livid or black color, the patient lies on her back, with her thighs drawn up and widely separated. She is scarcely able to move, cannot even support the weight of the bed-clothes. If the tumor does not give way, distention of the parts causes great pain. In some cases its progress is very rapid, the great effusion of blood causing syncope. In other cases the mucous membrane gives way in a short time, causing dangerous hemorrhage. If the labor is completed without a rupture of the tumor, it soon vesicates, becomes gangrenous, and the contents are discharged. In this case the blood is more or less clotted, and the hemorrhage is not so great. This tumor has been most frequently seen during natural labor. The tumor causes retention of the urine by pressing against the meatus urinarius. This tumor may be easily diagnosed from others, and distinguished from hernia by its irregular form, the fluidity of its contents, its color, and not being reducible, nor changed by coughing.

Treatment.—Hot packs should be applied to the tumor, and frequently changed, the bowels kept open by mild purges, and if there be hemorrhage, pressure applied to arrest it. If gangrenous ulcers, equal parts of baptisin and sulphate of zinc, followed by emollient poultices. The patient must be kept quiet, and if there be inflammation and fever, anti-inflammatory remedies, such as veratrum or aconite, should be given internally, and astringent and antiseptic poultices applied externally. Ligating the vessels may be resorted to in dangerous hemorrhages.

Warty Tumors of the Vulva.—These tumors may be developed upon any part of the external genitals, and have been found in the vagina. They may occur at any age, and may be single or in groups. In size they vary from a pea to a hen's egg. There is scarcely any difference in color between them and the adjacent parts.

Symptoms.—They commonly produce considerable irritation, causing a discharge of mucus. If large, they cause considerable inconvenience in walking, sitting, &c.

Causes.—Want of cleanliness; chronic inflammation of the parts, and frequently the sequelæ of syphilis.

Treatment.—They may be removed by the scissors or ligature.

DISEASES OF THE CLITORIS.

Inflammation, both acute and chronic, may exist either from a want of cleanliness, or be produced by masturbation.

Hypertrophy, or enlargement, may result from either of these forms of inflammation. It is accompanied with burning, itching, and smarting sensations; and in case of hypertrophy, extension of the labia, producing irritation, and labial leucorrhœa.

Treatment.—When the parts are inflamed, sitz baths, hot packs, and laxatives will usually relieve it. In case of hypertrophy, it may be painted once or twice a week with a weak tincture of iodine; and iodide of potassium, and compound syrup of stillingia, given internally. When there is extensive enlargement, amputation should be resorted to. This is performed by seizing the organ with a pair of hooked forceps, drawing it well forward, and clipping it with a pair of scissors. Lint and a T-bandage may be applied to arrest the hemorrhage, and the catheter used to relieve the bladder.

DISEASES OF THE BLADDER.

Introduction of the Catheter.—In young persons, the external orifice of the urethra is immediately below the symphysis pubis, and nearly level with its anterior face. In those who have borne many children, the urethra is shortened, and the orifice will be found behind the pubis, and near its posterior face. In enlarge-

ment of the uterus, the direction of the urethra will change, so that, in the latter stage of pregnancy, it will be found nearly perpendicular, passing along the inner surface of the symphysis pubis, and the meatus will be found behind the pubis, and near its posterior face.

During labor, the direction will be the same, but the descent of the head into the pelvis compresses the urethra, so that the catheter can with difficulty be introduced. In this case the head should be gently raised by two or three fingers of the hand, while with the other the catheter may be introduced. After labor, much care should be used in its introduction, as the tissues are much relaxed.

URETHRITIS.—This affection may be acute or chronic; the chronic form is liable to result from the acute. It may occur at any age.

Symptoms.—Constant pain along the urethra, greatly increased by passing urine. There is also bearing down; the urine is passed with great difficulty, and but a small quantity at a time, the patient having a constant desire to evacuate the bladder. In some cases the urine cannot be passed at all; for as soon as it touches the inflamed surface, spasms take place, which prevent the passage of a drop. In acute cases, the urethra will be extremely painful to the touch. If the orifice be dilated, the mucous membrane will be seen to be unusually florid, and it may be so swollen as to protrude from the orifice. In the acute form there is no discharge from the urethra, but in the chronic, sometimes there is ulceration, and a muco-purulent discharge.

Treatment.—If acute, apply hot packs to the vulva; let the patient drink freely of marsh-mallow tea, and give one or two drops of tincture of veratrum viride every hour or two. One half dram of the compound fluid extract of barosma and pareira brava may be given every two or three hours. Watermelon seed tea, drank freely, is also valuable. In the chronic form, thirty drops of the fluid extract of cannabus sativa, and three grains of sulphite of soda, should be given every two or three hours.

OCCLUSION OF THE URETHRA.—This is a congenital affection,

and may exist independently of any malformation of the other genital organs.

This malformation generally consists of a thin membrane stretched across the orifice of the urethra, though cases have been reported in which the closure affected even the whole canal. The urethra may be mechanically obstructed by cohesion of the labia.

Treatment.—The membrane should be ruptured by a small catheter; and, if it will not yield to gentle pressure, it should be punctured by a small trocar.

Foreign Bodies in the Urethra.—Foreign substances in the urethra consist either of substances introduced from without, or of calculi from the bladder. These substances, by contact with the walls, produce considerable irritation and spasmodic contraction, thus preventing their farther passage. Their exact position may be ascertained by the catheter, or sound. They may be removed by a small pair of polypus forceps. It is sometimes necessary to relax the urethra, especially if the substance be large. Owing to the great dilatability of the urethra in females, very large calculi can be passed.

A case is recorded where a stone, weighing four ounces, and another as large as a goose egg, were expelled without aid by mechanical means, or otherwise.

The urethra may be dilated by applying gelsemin, belladonna, or stramonium.

DISEASES OF THE VAGINA.

Occlusion of the Vagina.—This may be either congenital, or the result of disease. It may occur in any part of the vagina, or involve its entire extent.

Treatment.—This can be relieved by a crucial incision, or a simple cut. The edges should be kept apart by pledgets of lint, of considerable size.

Imperforate Hymen.—This is not likely to be discovered until the commencement of menstruation. It may then be suspected if the female has all the symptoms which accompany the menses,

without a discharge of the fluid, and if these symptoms should recur at regular intervals, accompanied with a sense of weight and fulness of the vagina, and especially if an enlargement is perceptible in the hypogastrium, with pain and tenderness.

The symptoms become ameliorated in the course of a few days, but return at each successive menstrual epoch. We may be sure that they are caused by imperforate hymen when we can discover between the labia a hemispherical tumor, of a livid or bluish color, soft, and fluctuating. In most cases the membrane has been found quite thin, but it is sometimes from one-fourth to three-eighths of an inch thick.

Treatment.—When the hymen cannot be perforated with the finger, it should be separated with a sharp-pointed bistoury, or punctured with a trocar.

Stricture of the Vagina.—This may occur as a natural malformation, or may arise as the result of disease. Congenital stricture, or narrowness of the vagina, is rarely met with. In some instances the vagina has not been more than half an inch in diameter. Acquired stricture of the vagina is much more frequent than congenital. It may arise from violent inflammation of the vagina, or from any thing that would produce induration and thickening of its walls, as the imprudent use of vaginal injections.

Treatment.—When stricture of the vagina is dependent upon inflammation, or upon prolapsus connected with inflammation, as it frequently is, the vagina should be frequently injected with warm mucilage, and the inflammation controlled by means of aconite, gelsemin, or mild purges. If the stricture be not overcome in this way, a graduated bougie should be introduced, and gradual pressure made until it is relieved. If the introduction of the bougie should produce much pain, the pressure should at first be slight, and the effort be repeated every two or three days until the stricture is overcome.

Acute Vaginitis.—This affection may be confined entirely to the mucous membrane, or it may extend to the sub-mucous cellular tissue. It is attended with pain, swelling, and redness of the vaginal canal; the mucous membrane is of a vivid red color, and the

rugæ are more developed and prominent than is natural. At the first stage there is an arrest of secretion; but after a day or two a serous exudation sets in, which becomes purulent, and of a yellowish or greenish color. As soon as this secretion is fairly established, the pain, heat, &c. diminish. If the sub-mucous tissues become involved, the inflammation may assume a phlegmonous form, and terminate in purulent collections, which empty into the vagina.

Causes.—The disease may arise from cold, which is the most frequent cause; from injuries to the vagina by violence, excessive venereal indulgence, exertion after delivery, high living, &c.

Treatment.—The vagina should be frequently injected with warm water, the patient kept quiet, and the inflammation controlled by tincture of veratrum viride. The chronic form of the disease may be treated as under the head of leucorrhœa.

Prolapsus of the Vagina.—This not uncommon affection has often been taken for prolapsus uteri. It is most common in females who have borne children, and are past the middle age, though in many cases it has been known in the young, and before marriage. We distinguish three varieties: prolapsus of the anterior wall of the vagina, or prolapsus vesicæ, or vaginal cystocele; prolapsus of the posterior wall, called vaginal rectocele; and prolapsus of the entire circumference of the vaginal canal.

Vaginal Cystocele.—It is the most common form, and may arise from any cause which tends to relax the vaginal walls, as repeated child-bearing, difficult labors, etc. This relaxation causes a change in the position of the bladder; there is retention of urine, distending it, and forcing it downward into the vagina. The more the bladder is displaced, the more difficulty there will be in evacuating it, owing to the backward curvature of the urethra; and by its greater weight the vagina is forced still farther downward and forward. If this continue, complete prolapsus will be the result.

Symptoms.—The patient complains of a constant weight and pressing down into the vagina, a sense of uneasiness and dragging in the lower part of the abdomen, uneasiness and pain in walking, great difficulty in evacuating the bladder, the bladder becoming

paralyzed from retention of the urine, and losing its power of contraction; often there is burning pain, with a sense of distention, and constant desire to pass urine. On examination, there will be found a soft, elastic, fluctuating tumor of a red or bluish red color, covered with the mucous membrane of the vagina; the surface of the tumor is smooth and shining when the bladder is distended; but when it is empty, it is thrown into tranverse folds. Often there is a discharge from the vagina which is exceedingly irritating to the labia and soft parts.

Diagnosis.—This affection may be distinguished from any displacement of the uterus by observing the following points:—The tumor varies in size, in proportion to the quantity of urine retained; it may be decreased by drawing off the urine with the catheter; and if the extremity of the catheter be elevated, its point may be felt in the most depending portion of the tumor. The tumor is soft and fluctuating, and the finger can be passed posteriorly to it up to the os uteri, which will be found in its natural position. It may be known from vaginal rectocele, by the fact that it is softer and fluctuating, and the finger passes into the vagina posteriorly to it, while in rectocele it can only be introduced anteriorly.

Vaginal Rectocele.—Prolapsus of the posterior wall of the vagina is less frequent than that of the anterior; yet it is not an unfrequent affection. The mechanism of this displacement is the same as vaginal cystocele; the posterior wall becoming relaxed, the rectum is distended with fæces, and pressed anteriorly and downward into the vaginal canal. The size of the tumor varies, from a slight one projecting into the vagina to its extension between the labia. In its more aggravated form, the uterus is frequently dragged down and displaced.

Causes.—The principal cause of this affection is habitual constipation.

Symptoms.—Weight in the vagina, dragging sensation in the abdomen, increased by walking, habitual constipation, with difficulty in passing the fæces, a mucous discharge from the vagina, &c. If there be much displacement, there will be tenesmus, with a frequent desire to evacuate the bowels, generally fruitless, and accompanied with much pain. The tumor increases in size when the fæces have

not been passed for some time, and during defecation, and decreases afterwards. A globular tumor may be felt, occupying the cavity of the vagina, compressible but not fluctuating: through its walls scybala may often be felt.

Prolapsus of the Entire Circumference of the Vagina.—This form of displacement is not very rare, and occurs as the result of great debility of the lining membrane of the vagina. It resembles prolapsus ani, inasmuch as mucous membrane, and the cellular tissues beneath it, being extremely lax, this cellular structure is morbidly thickened, and so increased in weight, that it overcomes the resistance at the outlet, and prolapsus is the consequence. The prolapsus may be either partial or complete: in the partial form, the mucous membrane merely forms a prominence within the os externum; while in the complete, it forms a circular tumor, which projects beyond the vulva.

Symptoms.—The symptoms of this affection vary according to the amount of displacement. In slight prolapsus, a feeling of weight and uneasiness in the lower portion of the vagina, a dragging sensation in the lower part of the abdomen, &c. In more severe forms of the disease, these symptoms become greatly aggravated: there is a discharge of puriform mucus, obstinate constipation, difficulty and pain in passing the urine, etc. The action of the urine on the tumor, and the friction produced by exercise, give rise to excoriation and inflammation. The tumor has a circular form, with an aperture in the centre. On passing the finger up externally to the tumor, it will be stopped by the cul-de-sac formed between the tumor and the vagina; but by introducing it through the central orifice, it will pass up to the os uteri.

Diagnosis.—It may be distinguished from any displacement of the uterus, by the character of the central opening, and by the fact that the finger can be passed up through this to the os uteri.

Treatment.—The treatment for these various forms of prolapsus of the vagina, consists in restoring the system to its general degree of health by a well-regulated course of regimen and general tonics, such as a liberal use of tonic tea, bebeerine, quinine, hypophosphite of iron, alnuin, helonin, and hamamelin. The bowels should be kept open by means of warm water injections. If there be inflam-

mation in the tumor, hot packs should be applied to the vulva and hypogastrium, and frequently removed. As soon as the constitution has been invigorated, and the inflammation removed, efforts should be made to reduce the prolapsus by lubricating the finger, and making gradual pressure, and other manipulations, so as to force the prolapsed folds back to their original position. These attempts, if not successful, should be repeated two or three times a week, and after each effort, a hot wet pad should be applied to the vulva, and secured by a T bandage, so as to make firm pressure. If this method fail, a large tapering vaginal bougie should be introduced, at the same time gradual upward pressure made upon the tumor, which will be found to disappear, either altogether or in part. The bougie should remain for one or two hours, and then be removed, and the vagina injected with a strong decoction of white oak bark and hydrastis canadensis. This operation should be repeated once or twice a week, followed by perineal support and injections until the displacement be overcome; after which the vagina should be strengthened by astringent and tonic washes, and the system thoroughly invigorated. Daily sitz baths, cornin, iron, tonic tea, wine bitters, hydrastis, and cinchonia, will contribute to this end. The cause of the disease should be carefully avoided.

Tumors, Morbid Growths, Etc. — Tumors, and morbid growths in the vagina, are said to be of rare occurrence. The cysts met with in this region, are developed in the cellular tissue, external to the vagina, and bear a subordinate relation to the latter. Fibroid productions may be developed in the external layer of the vaginal parietes, and especially at their posterior surface; they then project with a larger or smaller segment, in the shape of round tumors, into the vaginal cavity. In other instances they are developed in the cellular tissue; and though in close relation to the vagina in point of origin, project chiefly into the rectum. Warty tumors are sometimes developed from the vaginal mucous membrane; oftener, perhaps, from syphilis than any other cause. They are generally found in the external portion of the canal.

Diagnosis.—Encysted tumors of the vagina may be distinguished from vaginal enterocele, by its more circumscribed form, and from

the fact that coughing produces no enlargement in it. It may be distinguished from other diseases of these parts, by its circumscribed form, its consistence, and by the fact that its exact location can be discovered by an examination of the rectum, or by a sound introduced into the bladder. The diagnosis of fibrous tumors may be the same as that already described.

Treatment.—When the tumor is large, it may be removed by applying a ligature around its base, gradually tightening it until it is detached; or by careful dissection. When the tumor is small, it can be removed by cauterizing and poulticing.

VESICO-VAGINAL FISTULA.

Vesico-vaginal fistula is an opening between the bladder and vagina, through which the urine passes involuntarily. The passage of the urine through the fistula into the vagina produces a constant irritation of the mucous membrame, excoriation, pruritus, &c. If the opening be small, and toward the outer extremity of the vagina, it will be mild in comparison with those cases where it is large. In the last case the urine cannot be retained, as it escapes as fast as it is secreted.

Causes.—The most frequent cause is the long impaction of the head of the child in the pelvis during labor; the long, continuous pressure, producing inflammation, which may terminate in sloughing and perforation; careless, or improper use of instruments during labor; and the long-continued presence of a pessary in the pelvis.

Retention of urine during labor, or the presence of calculus, will generally involve more or less pressure, and give rise to subsequent inflammation. Retention of urine, if it be excessive, causing the bladder to project into the pelvis, so as to be pushed before the head of the child, will, most probably, prevent delivery, and occasion rupture of the bladder.

Vesico-vagina fistula may also result from venereal ulceration, cancer of the uterus, or vagina, etc.

Diagnosis.—A careful examination of the vesico-vaginal wall should be made by introducing a sound into the bladder, turning its point downward, so that it may be felt by the finger, introduced into the vagina, and thus examine the base of the bladder over its entire extent. If there be an opening, the finger will come in con-

tact with the sound, at some point. If an opening be found, the vagina should be carefully examined by the speculum, in order to detect its true character and position. If there be any suspicion of laceration after labor, the fact should be ascertained as soon as possible, as the circumstances attending recent parturition are all favorable to cicatrization. The vagina is relaxed and capacious, and, owing to the weight and size of the uterus, having as yet prevented the return of the parts to their usual height in the pelvis, any wound of the urethra or vagina will be far more easily seen and effectually treated than when the torn edges have become separated and cicatrized.

Treatment.—The treatment for vesico-vaginal fistula consists in the use of such medicines as will restore the health of the patient, strict attention to cleanliness, and the frequent use of warm water injections. To prevent the irritating effects of the urine upon the vagina, a catheter may be introduced into the bladder and secured, at the same time plugging the vagina with lint, lubricated. This practice, continued, has been known to cure bad cases. Another method, is to cauterize the edges of the fistula; then apply the catheter as before. The caustics used, are nitrate of silver and potassa. Another plan, is to pare off the edges of the fistula, and introduce sutures, to approximate the opening edges; then introduce a catheter, and treat the case as before. Dr. Sims uses the clamp suture, which consists of silver wire, and applied like the quilled suture. Iron, quinine, alnuin, and cod liver oil, should be given internally.

RECTO-VAGINAL FISTULA.

This is an unnatural opening between the vagina and rectum, which gives rise to an involuntary discharge of flatus and fæces. They are generally longitudinal in direction, and may depend on the following causes:—Prolonged pressure of the child's head during labor, or the careless use of instruments; laceration during delivery; a recto-vaginal abscess; a pelvic abscess, which opens in two directions, perforating the vagina and bowels; stricture or other disease of the rectum; cancer, or corroding ulcer of either rectum or vagina, and from syphilitic ulceration. If the opening be large, admitting of involuntary discharge of fæcal matter through the vagina, a continuous irritation

is kept up, which sometimes runs into a severe erythematous inflammation. If the existence of the local injury does not affect the general health of the patient, the distress of mind occasioned by her unpleasant condition is generally sufficient to do so. The seat and character of this fistula are ascertained by an examination per rectum and vagina. After the position of the vaginal opening has been ascertained by means of the speculum, introduce the finger into the rectum, and pass a probe from the vagina, through the fistula, until it can be felt in the rectum; by this means the character of the opening can be determined. If by any means the probe cannot be passed through the fistula, injections passed through it will enable the operator to determine its course.

Treatment.—The same as in vesico-vaginal fistula, and with tonics and alteratives.

LACERATION OF THE VAGINA.

This may be caused by forcible expulsive efforts during labor, or by the improper or careless use of instruments. The laceration may be complete; the whole of its coats giving way, and forming an opening into the bladder in front, the rectum behind, or into the abdominal cavity above; or it may be partial, affecting only the mucous membrane, or it and the middle coat. Either of these forms may exist without laceration of the perinæum. Complete laceration of the vagina in front and behind has already been described under the head of recto and vesico-vaginal fistula. Rupture of the upper portion of the vagina is of very rare occurrence. This accident would be dangerous, producing peritonitis, and should be treated on general principles. A laceration may exist when the medical attendant is not aware of it; the pain the parts suffer during labor being but little increased by the walls giving way. Careful examination of the parts should be made after labor, to ascertain if any lesion exists, as attention to it is of the utmost importance, while the parts are yet soft, and before inflammation supervenes.

Treatment.—The treatment consists in subduing the inflammation and preventing the vagina from occlusion by adhesion.

LACERATION OR RUPTURE OF THE PERINÆUM.

This accident, when severe, is one of the most distressing occurrences attendant upon labor. Slight laceration often happens in first labors, but the parts generally heal themselves. Again, the entire destruction of the perinæum may take place, laying the cavities of the vagina and rectum into one. Four varieties of ruptured perinæum are noticed. When the perinæum is torn to the extent of an inch or more from the fourchette, it is of but little moment. But when the perineum is torn between the sphincter ani and the constrictor vagina; where the laceration occupies the entire length of the perinæum, but does not penetrate the sphincter ani; and where it extends so as to divide the sphincter ani and the recto-vaginal septum, the disease is of a grave character.

Causes.—If the sacrum be too perpendicular, the head of the child, instead of receiving a direction anteriorly in the line of the axis of the lower outlet, will be forced downward upon the posterior portion of the perinæum. If the arch of the pubis be too acute, so as to prevent the presenting portion from filling the upper part, extraordinary dilatation of the orifice of the vagina will occur, and the head will be pressed with unusual force upon the anterior part of the perinæum. A similar effect is said to be produced by a thickened state of the perinæum and circumjacent parts of the pubis. The too rapid passage of the head may follow from this accident. Exostosis in any part of the pelvic capacity, may so act upon the direction in which the fœtal head is propelled, that rupture of the perinæum is the result.

Treatment.—To remove this difficulty, the surface of the opening should be made fresh, and interrupted sutures applied in sufficient number to bring the parts firmly in apposition. To maintain the parts in contact, and insure union, the sutures may be fastened to two small pieces of bougie, one placed on each side of the perinæum. After the introduction of the sutures, cold packs should be applied, to prevent excessive inflammation. The urine may be evacuated with the catheter, and the bowels kept quiet with small doses of opium.

PELVIC CELLULITIS, INFLAMMATION OF THE CELLULAR TISSUE.

Inflammation, as a consequence of parturition, is liable to occur in the cellular tissue, between the intestinal, genital and urinary canals; between the two folds of the peritonæum, forming the broad ligaments, and between the fascia pelvica and parts invested by it. Though it cannot be said to be a very fatal affection, yet it is in many instances of long continuance, and greatly affects the general health.

Causes.—It is probably of more frequent occurrence as the result of labor than from any other cause, either as a consequence of long-continued pressure of the child's head on the tissues of the pelvis, or as the result of puerperal inflammation. It may, however, result from ordinary labor. It may occur a considerable time after labor, or it may attack these tissues independently of the puerperal state in married or unmarried women. In the last case, it may occur from the extension of inflammation of the uterus, Fallopian tubes, ovaries, vagina, &c., from falls, blows, exposure to cold, &c.

Termination.—This affection, after passing through the different stages of inflammation, terminates favorably under judicious treatment, or there may be organization of the inflammatory product, and hypertrophy of the mass of cellular tissue; the uterus may adhere to the walls of the pelvis, or adhesion may take place between the ovaries and Fallopian tubes, and the other pelvic viscera, or the walls of the pelvis. An abscess is sometimes the result, which may form and discharge itself into the vagina, rectum, bladder, uterus, &c., the pus passing off through the various outlets of the several organs, or by an internal opening. It seldom discharges itself into the peritonæum, but if this should occur, severe peritonitis is the result. Sometimes the openings which these pelvic abscesses form for themselves, become fistulous, and are difficult to cure.

Symptoms.—The symptoms at first resemble those of inflammation of any of the pelvic organs. There are weakness, pain in the limbs, headache, loss of appetite, etc.; the pulse is accelerated; and also thirst, dry skin, and restlessness. Pain extends in all di-

rections, from the seat of inflammation, and there is a sense of weight, with dragging down in the pelvis, which is increased by the upright position. The irritation extending to the bladder and rectum, or the pressure of the abscess upon these organs occasions at times great distress by causing a constant desire to pass water, or to evacuate the bowels, which is sometimes attended with great difficulty. The disease may terminate in resolution, and gradually diminish, and the tumor entirely disappear. Or if it terminate in suppuration, there is a throbbing pain, with chills occurring at regular intervals, usually in the evening.

Treatment.—The bowels should be opened by an active purge of podophyllin and anti-bilious physic. At the same time the entire pelvis should be wrapped in a hot pack, which should be changed as often as it gets cold. After the action of the purge, small doses of veratrum viride should be given, and repeated until the inflammation be controlled. If abscesses occur, they should be opened after being poulticed, and brought as near the surface as possible. The pus may be prevented from re-accumulating by applying bandages in such a manner as to maintain gentle pressure; and the liberal use of anti-periodics, tonics, iodide of potassium, and cod liver oil. Some authors recommend the allowing of the abscess to open spontaneously; but this should not be done, unless it be very deep-seated, and cannot be brought to the surface. Chafing liniments, and even cupping, leeching, blistering, and the irritating plaster, in connection with strong iodine liniments, may be resorted to in protracted cases.

MENSTRUATION.

Menstruation is the term applied to the series of phenomena that attend the rupture of a Graafian vesicle. It is usually said to be a periodical sanguineous discharge from the female genitals.

Synonyms.—Menses, Changes, Catamenia, Monthlies, &c.—The appearance of the menses is an evidence of capacity for conception. The age of appearance is usually at fourteen, but varies from nine to twenty-four years. A cold climate delays, and heat hastens it. It is later with country girls of simple and laborious habits, while a luxurious life, balls, plays, exciting books, pictures, and the use of stimulants, hasten it, as well as a sanguineous temperament. There

are inequalities of spirits, headaches, lassitude, uneasiness, weight in loins or perinæum, pain in the back, tension in epigastrium, pruritus of vulva, mucous discharges, pain in the thyroid body, colicky pains, the skin has a peculiar odor, and is disposed to eruptions, congestion of mucous membrane, epistaxis, and irritation of breasts. Sometimes menstruation commences without precursory signs. The first few periods are frequently irregular, as to time of return and amount of discharge. The manifestations of the approach of puberty are seen in the development of the mammæ, the expansion of the hips, the rounded contour of the body and limbs, the development of hair on the pubes, the development of voice, reserve takes the place of forwardness, and the plays of the child are exchanged for the pursuits of womanhood. The *duration* is from a few hours to one week, or even more. The average is from four to five days. The *quantity* is from four to six ounces. Change of climate, from cold to hot, is said to produce excess, and change from country to city increases it. Women of bilious temperament are said to menstruate most profusely. Its nature is that of blood, mixed with vaginal mucus and uterine epithelium. It is thin, and of a dark, venous-blood color, with a faint, unpleasant odor. When discharged from the uterus it is alkaline, and usually coagulable; when from the vagina, it is acid, not generally coagulable, and contains lactic and phosphoric acid.

Mode of Discharge.—Guttatim.—On the first day, it is quite fluid, less highly colored, and less in quantity. The menses return usually every twenty-eight days. The varieties are twenty-two, twenty, eighteen, fifteen, or thirty-two, thirty-five, and forty days. The most important element is the regularity of return.

Cause.—The maturation of a Graafian vesicle. Menstruation depends on the ovaries. The proof is, that when these organs are removed, or even diseased, if the uterus be normal, the catamenia are absent, or cease, while, even though the uterus be absent, the menstrual molimen will give evidence of the existence of the ovaries.

Seat.—It is usually from the cavity of the body of the uterus—sometimes from the vagina, as a compensating discharge. The proof of its uterine origin is in *procidentia*, inversion, and occlusion of the os by the speculum.

Source.—The source is the uterine capillaries by rupture.

State of the Uterus.—The arteries and veins are more distended, the uterine tissue looser and more pink, the os more patulous, and the Fallopian tubes more vascular. The hypertrophy of the mucous membrane is like decidua. Cessation usually takes place at from forty-five to fifty years of age. The variations are thirty-six, thirty, twenty-six, twenty-four, fifty-five, sixty, seventy, ninety-one. The duration of the menstrual life is about thirty years. The period of final cessation is called change of life, turn of life, &c. The evidences are flaccid mammæ, cheeks flaccid and wrinkled, and the skin yellowish. The eyes lose their brightness—and sometimes there is a quasi beard. It is vulgarly supposed to be a critical period, but fewer women than men die between forty and fifty.

Varieties in Mode of Cessation.—Sometimes the menses cease gradually. They are sometimes excessive at one time, and then scanty. They sometimes cease and return, even at considerable intervals, or they may be irregular in time and quantity, or cease by a mucous discharge.

Reciprocal Influences of Acute Disease and Menstruation.—All acute diseases exert a somewhat similar effect on menstruation, but this influence varies accordingly as the disease is developed, during an epoch or an interval. In the first, the menses are ordinarily suppressed completely or incompletely, and may reappear, after some hours or days, usually diminished. In the interval, if the next epoch is near, menstruation is favored by the increased hemorrhagic condition of the organs. The menses are usually absent, or notably diminished, at the periods that occur during the decline of the disease, or in convalescence, lasting from one to three months. The menstrual eruption in nowise predisposes to disease, and it exerts no appreciable influence on the issue of acute febrile affections. No special therapeutical indication in the treatment of acute febrile disease is desirable from the state of the menses, and we must act without reference to them.

Disorders of Menstruation occur in four ways—*Amenorrhœa*, *Menorrhagia*, *Dysmenorrhœa*, and *Vicarious Obstruction.*

Causes.—1. Absence of the ovaries.

2. Occlusion of the os and vagina.

Amenorrhœa.—Amenorrhœa may exist in three forms: where the evacuation has never occurred; where there has been no secretion; and where the discharge has been interrupted. There are cases where the secretion has been perfect, but the discharge prevented by occlusion of the vagina, imperforate hymen, etc. Again, the secretion may never have occurred, owing to a congenital deficiency of the ovaries; and there are cases where the ovaries and uterus appear sound, connected with a regular monthly discharge of the Graafian vesicle, yet no sanguineous flow from the uterus or vagina. The most common variety, however, is where an obstruction occurs after the menses have become regularly established. It may cease by degrees, as is the case in scrofulous and consumptive patients; or occur as the result of cold, which induces inflammation of the uterus or ovaries. It may also be induced by excessive venery, pregnancy, wet feet, ice water, insufficient clothing, bathing, fear, grief, anxiety, drastics, emetics, falls, coitus during flow, etc.

Symptoms.—Weight, pain in the head, loins, and uterine regions, hot skin, apoplexy, epilepsy, vicarious hemorrhages, etc.

Chronic Amenorrhœa.—Chronic suppression may result from an acute attack, or gradually, as the result of some irregularity in the secretions of the uterus, thus preventing the maturing of the ova; or it may depend upon organic disease of the uterus or ovaries. The menses may disappear gradually, with a scanty, painful, serous discharge. Sometimes a painful monthly nisus, but no discharge occurs, or again there may be persistent leucorrhœa.

Symptoms.—Headache, vertigo, muscæ volitantes, dilated pupils, heat and cold, chills, dryness, constipation, urine abundant and limpid, dyspnœa, palpitation, and depraved appetite.

Treatment.—If the suppression be recent, apply hot mustard poultices to the mammæ. Give a hot foot-bath; also, the following compound:—Take senecin, ten grains; gossypiin, fifteen grains; apocynin, one grain; sacch. alba, one scruple. Mix; and make six powders. Dose, one every two hours. In bad cases, a hot sitz-bath should be given during the operation of the medicine. If this course does not succeed, iron, quinine, caulophyllin, senecin, wine, and tonic tea, should be given until the system is invigorated, and then the above treatment should be repeated. The chronic form of

the disease should be treated by supporting and invigorating remedies, such as bebeerine, macrotin, sitz-baths, galvanism, cod liver oil, and the mineral acids.

Dysmenorrhœa.—Dysmenorrhœa, or painful menstruation, occurs generally in single women, and is produced by inflammation, or ulceration of the os uteri; neuralgia of the uterus occurring at the menstrual period; masturbation; constipation; and a nervous, irritable temperament.

Symptoms.—Restlessness, heat, flushed face, pain, weight and heaviness in the head, pain in the back, pubes, coccyx, and thighs; sometimes so severe as to produce syncope. After some time, the pain becomes bearing down, and a shreddy discharge ensues. Sometimes a sac is discharged, being an exaggeration of the deciduous membrane that occurs normally at the menstrual period. But little effect is produced on the general health of the young and plethoric. In the nervous, the health fails, and, not unfrequently, phthisis ensues. All menstrual disorders are apt to awaken phthisis in the predisposed. Women subject to dysmenorrhœa after the cessation of the menses are liable to cancer.

Treatment.—When the disease is produced by inflammation or ulceration of the cervix uteri, hot sitz-baths, with hot vaginal injections frequently repeated, in connection with ten or fifteen drops of the tincture of corallorhiza odontorrhiza given every two or three hours, in connection with mild purges, will usually relieve it. When arising from neuralgia, the neuralgic mixture may be given in teaspoonful doses every two or three hours; or quinine, cypripedin, and iron may be used. Senecin, gossypiin and gelsemin are also valuable remedies. If the pain be very acute, and occur at the commencement of the catamenial period, a warm enema, containing from one-half to one ounce of the tincture of lobelia, gives almost immediate relief. When produced by an irritable constitution, iron, cypripedin, scutellarin and leonurus cardiaca should be given. The bowels should be kept regular; out-door exercise and a nutritious diet prescribed.

Menorrhagia.—Menorrhagia is characterized by profuse, prolonged, or too frequent menstruation, separately or conjoined. A

normal discharge in one woman may be menorrhagic in another. Climate has an influence—heat increases the flow, while cold diminishes it. The *Active* form occurs in early life in the robust, but is quite rare.

Symptoms.—Headache, hot skin, full pulse, weight in the back, hips, loins, pelvis, &c., are noticed for some days. A discharge produces relief.

The *Passive form* is caused by hot rooms, abortions, leucorrhœa, falls, excessive venery, long walks, constipation, &c. In pregnancy, it has its seat in ulceration of the cervix.

The health breaks; there is anæmia, and often hysteria: the signs are, pain in the head, flashes of heat, tinnitus aurium, pain in the side and palpitation.

Treatment.—Menorrhagia may be treated with cerasin, gelsemin, trilliin, helonin, and female injections of a decoction of hydrastis, matico and cinchonia. When the hemorrhage is active, the vagina may be injected by a strong decoction of tannin or geranin, and from ten to fifteen grains of capsicum administered. Fifteen or twenty drops of the oil of erigeron philadelphicum, given every ten or fifteen minutes; and ice applied to the hypogastrium and vagina, will also control the disease. In chronic cases, the system should be kept in a healthy condition, and the cause of the disease especially attended to.

VICARIOUS MENSTRUATION.

Vicarious menstruation is a discharge from some other part than the uterus, usually occurring in the unmarried. If in the married, conception is rare.

Nature.—Usually blood, sometimes leucorrhœal. It occurs in any part of the skin or mucous membrane, in the form of epistaxis, hæmoptysis, &c.

Treatment.—Ten or fifteen drops of the oil of solidago, should be given four or five times a day, in connection with iron, tonic tea, senecio gracilis, and sitz baths.

CESSATION OF THE MENSES.

At the period of life when the menses should cease, the discharge usually becomes irregular; sometimes being obstructed for two or

three months, or more. Among the symptoms of this period, are nausea and vomiting, swelling of the abdomen, tenderness of the breasts, &c. These symptoms are sometimes mistaken for pregnancy; connected with the above, there are frequently uterine pains, with dragging sensation in the back and loins; at times there is fever, accompanied by violent headache, a full, strong pulse, a loaded tongue, and symptoms of indigestion. The nervous system generally sympathizes with the other affections, causing nervous headache, neuralgic pains, periodic diarrhœa, and costiveness. These symptoms may all be mitigated by a sudden return of the menses, which may last much longer than is natural, and also be more profuse; upon their cessation they may again return in an aggravated form.

This period in female life is truly designated the critical period; and, although this is necessarily the case, owing to the important physiological changes which occur at this time, yet it is frequently made much more so, from the abuse of quack medicines.

Treatment.—When the symptoms are slight, but little more will be necessary than to regulate the bowels and diet, bathe the surface, and occasionally wear a pack on the lower portion of the bowels, wet with equal parts of water and whisky; but where they are severe, in addition to this, a purgative of antibilious physic should be taken, and afterward the following compound:—Take aletrin, thirty grains; cypripedin, twenty grains; ptelin, thirty grains; carbonate of iron, thirty grains; white sugar, three ounces. Mix, and add to one pint of port wine. Dose, one tablespoonful three times a day. Also, take irisin, thirty grains; hyoscyamin, five grains; podophyllin, two grains; extract of dandelion sufficient to make thirty pills. Let one be taken night and morning. If neuralgic pains should occur, take belladonna, one grain; quinine, fifteen grains; white sugar, twenty grains. Mix, triturate, divide into eight powders, and take one three times a day. Constitutional symptoms of every variety manifesting themselves during the period, should be met with such remedies as are indicated.

LEUCORRHŒA.

Leucorrhœa is a discharge from the vagina, or inner cavity of the uterus, of a catarrhal character, varying in color from a light

to a yellowish-green, or reddish-brown. It is usually caused by endometritis, or inflammation of the mucous membrane of the womb, or vagina. For pathology, see Inflammation and Congestion of the Uterus.

Treatment.—The treatment for leucorrhœa must depend much upon the cause. The cause should first be removed, then the attention be safely directed to the irritation and inflammation of the cervix uteri, uterus, and vagina. This can best be removed by daily alkaline baths to the surface, in connection with antibilious physic, followed by small doses of veratrum viride or gelsemin, and rest. If it be an acute case, cold water vaginal injections; or, if chronic, hot water injections will assist in removing the congestion or inflammation. After the inflammation is removed, if the discharge continues, female injections of a strong decoction of equal parts of golden seal, white oak bark, and cinchonia, should be frequently used during the day, and from one to two grains of hamamelin, in connection with small quantities of iron, should be given two or three times a day. Cornin, bebeerine, macrotin, caulophyllin, and gelsemin, are also used for the same purpose. Sitz baths, hot packs over the epigastrium, electricity, and an irritating plaster to the sacrum, may also be used.

In cases where the above treatment fails to afford relief, a weak solution of iodine applied to the mucous membrane of the vagina and uterus may often prove beneficial. Nitrate of silver, of the strength of five or ten grains to an ounce of water, has also been applied; and even a weak solution may be injected into the cavity of the uterus in very malignant cases.

CONGESTION AND INFLAMMATION OF THE UTERUS.

This disease is but imperfectly understood, and more frequently than otherwise, passes unobserved both by the patient and her medical attendant. In a great majority of cases, it is treated by physicians as prolapsus uteri, amenorrhœa, dysmenorrhœa, menorrhagia, or leucorrhœa; the primary cause of the disease is overlooked, and the symptoms only receive attention. Hence it is that but little, if any benefit, is derived from the ordinary course of medication in this class of cases.

The hydropathists have required some reputation for treating this

class of cases, and in many instances they have had superior success. Their success, however, is not dependent upon a more extensive knowledge of the affections, as much as the remedy upon which they rely being better adapted to relieve this peculiar pathological condition of the uterus, than those generally used for this purpose.

Congestion of the uterus, like that of other organs, is a disease of frequent occurrence, and is caused by the accumulation of blood in the veins and capillaries. The congestion is generally combined with infiltration into the cellular tissue of the uterus, producing œdema, which, in some cases, is very considerable.

Symptoms.—On making a vaginal examination of the uterus, a complete congested appearance is manifest. The uterus is enlarged and vesicular, and in places the veins have a varicose appearance. In the incipient congestion of the uterus, the appearance very much resembles that of early pregnancy. The uterus is tender upon pressure, and if the disease be of long standing, the broad ligaments and vagina also present a similar congested condition. In other cases, there is excoriating granulations, or ulceration of the neck of the uterus and its lining membrane. Congestion of the uterus, like that of similar tissues, is followed by pathological changes in the organ; such as an increased afflux of blood to the part, and a loaded condition of the capillaries. In the chronic form, the uterus and vessels, after having been thus distended for some time, contract upon their own contents, forcing the more fluid portions of the blood out of the vessel into the adjacent areolar and cellular tissues; and in this way the parenchyma of the uterus becomes extensively infiltrated with the fluid portion of the blood. Where the congestion extends to the vagina and inner membrane of the uterus, a similar exosmosis occurs from the congested capillaries of the parts: instead of being retained in the parenchyma, it escapes into the cavity of the uterus and vagina, mixing with the mucus, and thus constituting what is known as the whites. In case the blood is anæmic, and the patient of a scrofulous cachexia, the salts of the blood, held in solution, will make their escape with the serum, and, mingling with mucus, cause a muco-purulent, or muco-serous discharge. If there is abrasion of the uterus or its appendages, the sanious secretion from the ulcer, mixed with the disintegrated tissues of the parts, often renders the discharge not only offensive, but exceedingly irritating,

denuding the vagina of its mucous surface, and inducing either an acute or chronic inflammation. The constitutional symptoms are a sense of weakness, weight, or pain in the back; the patient complains of nervousness, pains in the head and shoulders, often changing to different parts of the body. The functions of the stomach and bowels become deranged; the countenance is sallow, and the skin has a dry and husky appearance; the lips lose their color, and the eyes their natural brilliancy; the feet and hands are mostly cold, although in some cases, and in some portions of the day, they are hot and burning. The menses are mostly irregular, either in quantity, quality, or time of occurrence. I have observed all these symptoms in connection with congestion of the uterus. If the disease be allowed to advance, palpitation of the heart will occur, with cough, bronchial irritation, and expectoration of mucus. At this stage of the disease, the increased weight of the uterus, together with the relaxed condition of the muscular tissue, causes the uterus to gravitate into the pelvis, resulting in what is usually known as prolapsus uteri. The lower floor of the abdominal cavity thus giving way, enables the whole contents of the abdomen and thorax to settle from their normal position. The bowels, stomach, liver, spleen, heart, and lungs, all being thus displaced, put the upper portion of the lung upon a stretch, producing a constant irritation, and materially increasing the cough, which before was considerable. If this condition be allowed to continue, the blood becomes impoverished, owing to a defective appetite, irrregular respiration, and leucorrhœa; and a tuberculous deposition occurs in the lungs. In cases where the uterus has become impregnated, the symptoms frequently somewhat abate, although, in several cases, I have known them to be very much aggravated, and maintain an uncommon obstinacy during the entire stage of gestation. Where the uterus remains thus congested during pregnancy, the disease is very liable to terminate in inflammation immediately after delivery, proving very obstinate, and, unless properly treated, disastrous to the patient. In these cases there is acute pain just above the pubes, quick pulse, hot skin, and retention of urine, either partial or complete. The tongue will soon be covered with a dark brown coat, and many times there are convulsions. The bowels are constipated, and in some cases there is nausea and vomiting.

If the disease be not controlled, delirium, coma, and death ensue. The inflammation may be less acute, extending to the perinæum, causing a tympanitic condition of the bowels, suppression of the lochia and milk, with violent fever.

Causes.—There are a variety of causes which may produce this condition of the uterus; such as the frequent use of emmenagogues, which contain mercury; exposure of the feet to the damp and cold earth by wearing thin shoes; the practice of dressing in such a manner as to compress the waist, thus preventing the return of the venous blood to the heart by the superficial veins, also obstructing the capillary circulation; hence the blood is forced through the deep capillaries, inducing congestion of the uterus. It may also be caused by repeated abortions, by excessive venery, by cold and exposure; in short, any thing which will induce it in any of the internal viscera, will produce it in the uterus.

Treatment.—In commencing the treatment of this disease, the cause should be constantly kept in view, and, as far as possible, removed. To remove the congestion, a plaster should be applied to the abdomen over the uterus, composed of the following materials:—Gum galbanum, two ounces; white pine gum, one ounce; white wax, one ounce and a half. Melt the gums and wax together, add one drachm of pulverized blood-root, and stir until it becomes thickened; spread a coat of it upon a thin piece of leather, large enough to cover the uterus, and apply. It should be renewed from time to time until relief is effected. At the same time, give the following compound:—Gelsemin, two grains; bebeerine, thirty grains; caulophyllin, ten grains; white sugar, thirty grains. Mix, triturate, divide into twelve powders, and give one every three hours. During the administration of these powders, vaginal injections of the cold infusion of cinchona should be used two or three times a day. During the early part of the treatment, a thorough hand-bath should be taken every morning as indicated; also an occasional sitz-bath. The above treatment should be pursued for ten or fifteen days; the following may then be substituted:—Carbonate of iron, one dram; pulv. queen of the meadow, two ounces; cream of tartar, one ounce; port wine, one pint; sugar, one pound; gin, one pint. Dose, one tablespoonful three times a day. At the same time take fol. juglans regia, or walnut leaves

six ounces; port wine, one pint. Make a tincture, and use a syringe full, as vaginal injection, once or twice a day. The plaster should be removed, and a wet girdle worn around the lower portion of the abdomen and back. During the entire course of treatment, the bowels should be regulated by the use of neutralizing mixture. If any of the symptoms, described as dependent upon this disease, should remain after using the above remedies for a reasonable length of time, take macrotin, twenty grains; senecin, ten grains; capsicum, twenty grains; Vallet's ferruginous mass, one ounce. Mix, and form a mass. Make three-grain pills, and let one be taken three times a day, alone, or in connection with other medicines as indicated. If there should be ulcers upon the vagina or uterus, the speculum should be introduced, and the vegetable caustic applied, after which the ulcer should be covered with powdered slippery elm. Much care will be required in making this application, to prevent the caustic from coming in contact with parts not diseased. If there be a scrofulous diathesis connected with this disease, stillingia and iodide of potassium may be used in connection with the other remedies. The diet should be free and nutritious. In case the congestion should terminate in a latent form of inflammation, muriated tincture of iron, veratrum, cinchonin, and cornin, in connection with the local applications, as directed under the head of congestion. Where active inflammation ensues, a full cathartic of podophyllin and cream of tartar should be given in the commencement, followed by cold packs to the bowels, and full doses of muriated tincture of iron and quinine. If convulsions are connected with the inflammation, gelsemin, lobelin, and belladonna, should be used in sufficient quantities until that symptom is relieved. During the inflammatory stage, the patient must be kept quiet, but in the congestive form of the disease, moderate exercise should be taken.

ULCERATION OF THE UTERUS.

Ulceration and congestion of the os uteri is the true pathology of the vast majority of cases called leucorrhœa. It exists in virgins, the non-pregnant, pregnant, but most frequently in those who have borne children.

Causes.—Coitus, imprudence during menstruation, as standing,

walking, lifting, &c., and, very often, premature efforts after abortion or labor.

Symptoms.—The most frequent is leucorrhœa, varying in quality, being mucus, purulent, or starchy; in color, milky, greenish, yellowish, or brownish—often tenacious masses of mucus, like starch, come away.

Treatment.—When there is absolute ulceration of the os, a glass speculum should be introduced into the vagina, and the os cauterized with a solution of nitrate of silver, of the strength of fifteen grains to an ounce of water. It can be applied by means of a probang. After each application, and previously to removing the speculum, a small amount of the superfine flour of slippery elm should be applied to the os. The constitutional symptoms should be treated according to their nature. Vaginal injections of a decoction of red raspberry leaves and golden seal will also prove beneficial.

The bowels should be kept regular by means of neutralizing mixture and leptandrin, and the following powder should be given:—Take gelsemin, two grains; caulophyllin, ten grains; hamamelin, twenty grains; hypophosphite of soda, five grains; sacch. alba, thirty grains. Mix. Triturate. Divide into fifteen powders. Dose, one four times a day.

After the inflammation is subdued, give a tonic as follows: Take chamomile flowers, eupatorin, purpurin, caulophyllum thalictroides, of each half an ounce; port wine, one quart. Mix. Dose, one tablespoonful three times a day. During the administration of this medicine, the baths and injections should be continued, the diet well regulated, and the patient allowed to take free exercise in the open air.

PROLAPSUS UTERI.

Falling of the womb is denoted by pain in the back and loins, and subpubic region, heat in the vagina, painful coitus, menses painful and irregular, constipation and diarrhœa, bladder irritable: the cervix is lower than usual, lips large and tumid, the anterior portion of the os is soft, spongy and hot; there is a velvety feeling, and sometimes tenderness on pressure.

There may be ulcers, varying in size from a pea to half a dollar.

They are bright red, deep red, granular and bleeding, whitish, patchy, with the base coated, and the edges angry. Authors divide them into granular, cockscomb, bleeding, superficial erosive, varicose, fissured, and follicular.

Symptoms.—All varieties of dyspepsia, hysteria, neuralgia, cough and dyspnœa.

Prognosis.—Probably no disease, so severe in its effects, is so easily cured.

Treatment.—In case of prolapsus uteri, the patient should observe perfect quietude. The inflammation should be treated as previously described, after which the uterus should be replaced by introducing the index finger into the vagina, and grasping the abdomen above the pubis, when, by a rapid extension of the finger, and an upward pressure of the abdominal parietes, the uterus should be carried up to its normal position, after which the vagina should be injected with a warm decoction of equal parts of hemlock and white oak bark;—the bowels kept open by means of mild laxatives, and such constitutional treatment instituted as will restore the patient to her normal health.

In no cases have I found either the abdominal or vaginal support useful, further than to afford temporary relief during the treatment. For this purpose, however, the gutta percha ring, and the abdominal supporter, may be occasionally used.

POLYPUS OF THE UTERUS.

By polypi is understood all those forms of tumors attached by pedicle to the inner surface of the uterus. They are of different sizes, varying from a pea to that of a child's head. They may be of a fibroid, mucous, or gelatinous character.

Symptoms.—Frequent attacks of flooding, profuse leucorrhœa, ardor urinæ, enlargement of the uterus with tenderness, loss of appetite, and constipation. Upon making a manual examination, if the tumor protrudes from the womb, it can be detected, and the os will be found dilated. If the tumor has not escaped from the uterus, it can only be detected by introducing the uterine sound. This can be accomplished by introducing a vaginal speculum, dilating the os uteri with extract of belladonna, and exploring the cavity of the

uterus. If the tumor be in the vagina, no difficulty will exist in making out the diagnosis.

Treatment.—When the tumor is in the vagina, after making a thorough exploration of its position with the uterine sound, the pedicle should be cut through with a pair of curved, blunt-pointed scissors, and the tumor removed. There is usually but little hemorrhage following, and the only after-treatment is to inject the uterus with hydrastis canadensis. Or the polypus may be removed by placing a ligature around the neck, and gradually tightening it. If the polypus has not escaped from the uterus, the os and cervix should be dilated by introducing a small sponge well lubricated with sweet oil, and saturated with tincture of gelseminum. The sponge should remain for twenty-four hours, when it should be removed, and a larger one introduced, and so on, until the os is thoroughly dilated, or at least sufficiently to allow the introduction of the finger into the uterus. Then a ligature may be applied, and tightened, as previously mentioned. Gooch's canula, provided with a windlass, is the best instrument for this purpose. The ligature should be tightened, so as to remove the tumor in twenty-four hours; and in case of hemorrhage, erigeron, capsicum, and astringent injections should be used.

OCCLUSION OF THE OS UTERI.

This may be congenital, or the result of disease, and partial or complete. The symptoms do not manifest themselves until after the age of puberty, when, if this difficulty be present, there will be no appearance of the menstrual discharge; yet the symptoms accompanying menstruation will be present at the recurrence of each period.

The symptoms of occlusion of the os uteri are weight and pain in the loins, and finally the appearance of a tumor in the upper portion of the pelvis, resembling the impregnated uterus.

Treatment.—In most cases the occlusion may be overcome by a uterine sound, which should be pressed through into the uterus. If this do not succeed, an opening should be made with a trocar.

PHYSOMETRA, OR TYMPANITIS UTERI.

This is an accumulation of gas in the uterine cavity, supposed to arise from the decomposition of some substance in the uterus. This

gas is sometimes retained for several months, and then expelled; at other times it is expelled with a noise many times a day.

Causes.—The retention of the membranes after labor, the placenta, a dead fœtus, or secretions, as the lochia, menstrual discharge, etc.

Symptoms.—Distention in the hypogastric region, with pain, extending from the womb towards the groin, thighs, &c. Generally the menses are suppressed, the abdomen enlarges, and is tympanitic. There are sometimes febrile symptoms, and it is not uncommon for the breasts to become enlarged, and to secrete a milky fluid. The expulsion of gas at the vulva gives relief. It is rare for gas to be retained in the uterus more than five or six months; frequently not so long.

Diagnosis.—It may be distinguished from pregnancy by the resonance of the tumor, and the absence of fœtal movement. Its resonance also distinguishes it from all other tumors.

Treatment.—To give immediate relief, a catheter may be introduced into the uterus, and the gas evacuated. Afterwards the cause should be removed, uterine tonics, and an invigorating course of medication, should be instituted.

HYDROMETRA—UTERINE DROPSY.

This is an accumulation of fluid in the uterus; either underneath the mucous membrane, in the uterine cavity, or in hydatids. Cases are known of both air and water in the organ. Internal metritis gives rise to this disease by causing contraction of the os internum of the cervix, and retention of the secreted fluid, which, increasing in quantity, a change takes place in the secreting surface, by which a colorless, albuminous fluid is exuded. This fluid is sometimes evacuated in large quantities.

Causes.—Inflammation of the uterus, and constitutional debility.

Symptoms.—During the first months the symptoms resemble those of pregnancy. By introducing a finger, so as to touch the cervix uteri, and pressing the tumor with the other, the fluctuations of a fluid are felt. The menses are usually suppressed, and general constitutional debility will appear, if the disease continue. The patient may die from exhaustion, or the walls of the uterus may

give way from the pressure of the fluid, causing fatal peritonitis by its escape into the peritoneal cavity.

Treatment.—The water may be evacuated with a catheter, the cause of the disease removed, and a tonic and hygienic course of treatment prescribed.

ANTEVERSION AND ANTEFLEXION OF THE UTERUS.

The existence of anteversion was first verified by Levret. Retroflexion was not recognized as distinct from retroversion for many years afterwards; and even now, by some writers, the word retroversion is made to include both displacements. The distinction is

FIG. 41.

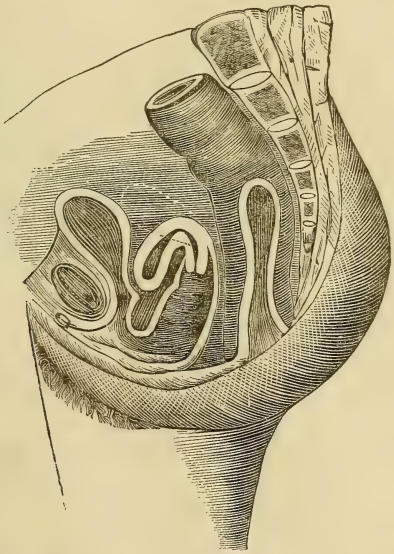


FIG. 41. ANTEFLEXION.—The womb is seen in the state of complete anteflexion—the second degree, or complete anterior reduplication—it falling into a cavity between the anterior wall of the vagina, and the posterior wall of the bladder. The dotted lines show the position of the body of the uterus in the first degree of anteflexion. Neither the uterus itself, nor the dotted lines are placed sufficiently low; and the rectum being represented as distended, the position of the first degree of anteflexion appears to be nearly coincident with the normal position of the uterus. Generally in anteflexion the uterus is inclined to one side, and the bladder to the other.

not so indispensable in a practical point of view as between retroversion and retroflexion, but should be kept constantly in view. They are not, any more than the posterior displacements, merely different degrees of the same thing, and anteversion, like retroflexion, most frequently follows parturition, either premature or otherwise; while anteflexion is, and even more than retroflexion, most frequently independent of it.

In anteflexion the body only of the uterus falls forward, the cervix still preserving its normal position in the pelvis; the point of flexion being always at the junction of the body with the neck. In anteversion the whole uterus is displaced forward, but without any flexure of the body upon the neck; so that it comes to assume an antero-posterior position in the pelvis, the fundus pointing forward.

We recognize but two degrees of each of these displacements. In the *first* degree of each, the body of the uterus falls forward upon the posterior wall of the bladder (if somewhat distended) so that its axis prolonged would fall below the middle point, between the umbilicus and the symphysis pubis. In case of anteflexion this would cause a bend of the body upon the cervix at about a right angle. In the *second* degree of both, the fundus points towards the symphysis pubis. In anteversion it crowds the posterior wall of the bladder forwards into its cavity; while in anteflexion it falls down between the anterior wall of the vagina and the neck of the bladder, (after stretching the areolar tissue connecting them,) and thus a complete reduplication of the uterus anteriorly ensues. In retroversion, the neck of the uterus is also displaced backward, looking, in the second degree, towards the hollow of the sacrum; while it is not displaced at all in anteflexion.

We must, however, admit, as in case of the displacements backward, every possible grade of malposition between the first degree of anteversion, and complete anterior reduplication. We also very often find some degrees of prolapsus accompanying anteversion, and, rarely, anteflexion also. In regard to the frequency of the anterior and posterior displacements, in my opinion the latter are the most numerous. In those who have borne children, I have found anteflexion more frequent than retroflexion. Both anteversion and retroversion are rare in this class of patients.

Causes.—The *direct* causes of anteflexion and anteversion include all agencies which carry the body of the uterus forward and downward, and may be either uterine or extra-uterine. The former are congestion or inflammation of the body of the uterus (or of the posterior wall alone,) a fibrous tumor in the latter or in the posterior wall, if large enough to crowd the whole uterus forward; polypus uteri, and hypertrophy from previous inflammation, or from arrested involution after parturition, and early pregnancy.

The predisposing causes are relaxation of the broad ligaments,

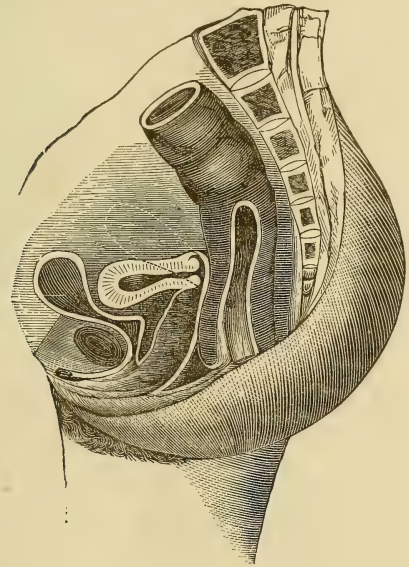


Fig. 42.

Fig. 42. ANTEVERSION—Showing the first and second degree.

or increased weight of the uterus from any cause, and especially from parturition.

Of anteversion in the second degree, the most common symptoms are the following:—Frequent micturition; perhaps, also, rectal

tenesmus, and especially during the catamenial period; a bearing down sensation; pain in the lumbar and inguinal region, and down the limbs; sometimes a feeling in the rectum from direct pressure against the cervix; and constipation from torpor of the muscular coat of the alimentary canal. All these are increased during the menstrual period, and by standing, and walking; and diminished, while in a recumbent position. Generally leucorrhœa also exists, and menstruation is abnormal.

The *physical* signs of anterior displacements are alone conclusive, as in the case with the posterior. The first degrees of anteversion or anteflexion may afford no symptoms, and therefore in most cases escape detection. In the former, however, there will be found a backward displacement of the cervix on making a vaginal examination; but the sound alone will generally give evidence of the latter.

In the *second* degree of *anteversion*, a vaginal examination shows that the uterus lies horizontally in the pelvis, the os pointing back towards the rectum, and the fundus forward towards the neck of the bladder; consequently the curve of the vagina is changed, its upper extremity too far backward. Often the finger may trace the whole length of the uterus on its anterior (now its inferior,) surface. Frequently the os uteri is carried so high posteriorly as with difficulty to be reached, but the sound is very seldom required to verify the complete anteversion.

In the *second* degree of anteflexion, or complete anterior reduplication, the os and cervix are found in the normal position in the vagina, though the upper extremity of the latter is often carried a little backward, while the fundus is felt as a firm, rather tender, rounded tumor, lying between the anterior wall of the vagina and the bladder. Sometimes, however, the fundus is quite insensible to pressure, and thus might be easily mistaken for a fibrous tumor in the anterior wall of the uterus: besides, since only the anterior wall of the vagina intervenes between the cervix and the fundus, the latter may seem at first to be continuous in structure with the latter, and thus farther confirm the suspicion of a fibrous tumor. *Per rectum* the os uteri may be felt projecting backward in the second degree of anteversion; but no positive knowledge is acquired in this case of anteflexion. But if any doubt remain, the *uterine sound* decides the diagnosis.

In using this instrument in case of *anteflexion*, we introduce it with the concavity upwards, as if the uterus were in its normal position, the patient lying on the back, and when the bulb is arrested on reaching the point of flexion, the handle is depressed, and thus the instrument passes into the proper cavity of the organ.

Diagnosis of Anteflexion and Anteversion.—*From fibrous tumors in, or inflammation of the anterior wall of the uterus:*—The fundus uteri is usually tender in tumors, usually not so, but the sound decides in both cases. This localized inflammation, however, but rarely occurs. From *early pregnancy:*—All the signs of pregnancy are wanting, therefore the sound, on being used, decides. If there be any doubt as to the pregnancy, wait; at any rate, do not use the sound. Sound shows the uterus is *in situ*, but enlarged, and its cavity elongated. From *carcinoma of the uterus:*—Carcinoma almost always invades the cervix uteri first; but use the sound. From an ovarian (or other pelvic) *tumor:*—The sound isolates the uterus from the tumor. From *extra-uterine pregnancy*:—Here again, the sound isolates the uterus, if in its normal position, from its extra-uterine mass. The anteflexed uterus sometimes inclines to one side, and may be mistaken for a *displaced* ovary: the sound will decide.

Treatment of the Anterior Displacements of the Unimpregnated Womb.—The *local treatment* of the anterior displacement is threefold. To remove the cause of displacement, and certain complications, if still existing, and in action, to replace the uterus, and to retain it in its position. First, *remove still active causes or complications.*

To replace the uterus the patient should lie upon her back with the pelvis raised, and in case of *anteversion* the cervix may be brought forward by means of the fenestrated spoon, as described by Madame Boivin. A long index finger may, unaided, accomplish this; or, these means failing, the uterine sound, passed an inch into the canal of the cervix, may bring the os into position. In case of *anteflexion* we may, also, sometimes elevate the fundus uteri to the first degree of the displacement, by pressing against it with the index finger in the vagina. But neither in anteflexion nor ante-

version, can we, with certainty, restore the uterus to its normal position by any other means than the use of the uterine sound.

In the *palliative* management of *anteversion*, a simple ring pessary, of tin or gutta percha, large enough fully to distend the upper extremity of the vagina, and thus pull the os uteri forward, is to be used.

We need not be very strenuous respecting the precise form of the instrument used, provided it fits well. It may, however, prove valuable in three ways. By pulling the os uteri forward, conception may occur in a patient previously sterile. It keeps the uterus more nearly at rest, and thus gives great relief, if there be irritation from inflammation or congestion. It relieves the slight degree of descent which often accompanies anteversion, and which not seldom is the main cause of the patient's suffering.

In cases of anteflexion in those who have never been pregnant, and in whom the vagina is narrow, and still retains its natural tone, I have found a more simple instrument, which is made of pure silver, and consists of a stem (a tube) two-and-three-quarter inches to three inches long, and three-sixteenths of an inch in diameter, passing centrally through two flattened bulbs. The smaller of them, about five-eighths of an inch in diameter, is placed about two-and-a-quarter inches from one end of the tube; this free portion of the tube being the stem, or intra-uterine portion of the instrument; while the other bulb, one inch in diameter, is placed at the other end of the tube.

When the instrument is introduced, the smaller bulb supports the os uteri; while the larger (one-half inch below the other) rests on the posterior wall of the vagina, above the levator ani. It is passed into the uterus on a staff. A silk thread is passed into it, so that the patient may remove it at any time, if this become necessary. In connection with the above treatment, uterine tonics, astringent injections, sitz baths, and friction, should be used.

RETROVERSION OF THE UTERUS.

Retroversion of the uterus consists in a displacement of the fundus uteri backward, the cervix being carried forward against the bladder, the uterus assuming a transverse position.

Causes.—The causes of this form of uterine displacement, are a

weakness of the uterine organs, long-continued distention of the bladder, abortions, chronic inflammation of the uterine organs, violent vomiting, &c., &c.

Symptoms.—The most common symptoms of retroversion of the uterus, are such as exist in the early stages of pregnancy, viz., dyspepsia, dragging pains in the hip, neuralgia, hysteria, nervous debility; and if the disease should continue, bronchitis and consumption often follow. If retroversion occur during early pregnancy, in addition to the above symptoms, there will be either partial or complete retention of the urine; and by manual examination a tumor will be felt, which is tender on pressure. Anterior to this tumor may be felt the cervix uteri.

Treatment.—One of the first things to be attended to in the treatment of this disease, is the replacement of the uterus. To do this, make a gentle rotary motion with the hand upon the abdomen, and at the same time elevate the uterus, and carry it back into its proper position, when the pad and bandage should be applied, as directed in the treatment of prolapsus uteri. In connection with these mechanical means, female injections, composed of equal parts of cold infusion of Peruvian bark and golden seal, should be used frequently through the day.

The body should be frequently sponged in cold water, followed by brisk friction with the hand or towel, and the following tonic bitters administered:—Take one pint of best port wine, one dram of precipitate carbonate of iron, one-half ounce of pulverized unicorn root, and one-half ounce of life root. Mix, and allow the patient to take from a tablespoonful to one wine-glassful three times a day. Small doses of helonin and rhusin, or senecin, in combination with pyrophosphate of iron, may be used with the bitters, or instead of the bitters.

HYDATIDS OF THE UTERUS.

The formation of small cysts or bladders of water in the uterus, are by no means uncommon. They are mostly developed from the inner membrane, and vary in size from half a pea to a partridge's egg. They are usually oval, with a thin wall, opaque, and contain a thin pellucid fluid. They may be numerous or few in number. More frequently, however, they are in clusters, and numerous.

Symptoms.—The symptoms of hydatids are frequently those of early pregnancy; such as nausea, vomiting, enlargement of the uterus, fulness of the breasts, suppression of the menses, &c. In from two to five months, the patient feels a weight and uneasiness about the abdomen, which is usually followed by uterine pains, hemorrhage, and expulsion of the hydatids.

Treatment.—If the flooding be excessive, from five to ten drops of the oil of erigeron should be given, repeated every ten or fifteen minutes, until the hemorrhage is controlled. If the pain should not be sufficient to expel the cysts, a warm infusion of equal parts of blue cohosh and cotton root should be given, in one or two-ounce doses, every twenty or thirty minutes, until the uterus seems to be entirely evacuated. Or, give the following compound:—Take caulophyllin, ten grains; gossypium, twenty grains; sac. alba, thirty grains. Mix. Triturate, and divide into five powders. Give one every ten or fifteen minutes, until the hydatids are all expelled.

The patient should afterwards be treated with chalybeates and tonics. If there still remain difficulty in removing the hydatids, ergot and galvanism may be resorted to.

NEURALGIA OF THE UTERUS.

By neuralgia of the uterus, is understood a sharp violent pain in that organ, usually occurring very suddenly, of a rheumatic character. It generally attacks girls shortly after puberty, and is dependent upon derangement of the uterine function.

Symptoms.—The patient may be perfectly well apparently, and may be attacked with violent lancinating pain in the uterus, which usually lasts for a few minutes only, but soon returns, assuming a regular periodical character. In some cases it is connected with hysteria, the patient becoming excessively nervous, and the pain moves to different parts of the body.

Treatment.—A pill made in the following manner, is almost a specific in the above disease:—Take the extract of garden lettuce, thirty grains; gelsemin, one and a half grains; dioscorin, ten grains. Mix, and form ten pills, and give one every hour until the pain subsides.

To prevent a return of these attacks, one or two moderate doses

of quinine and prussiate of iron should be given two or three times a day, for eight or ten days, or the neuralgic mixture may be used.

PUERPERAL FEVER.

This is a very fatal disease, which frequently follows parturition. In certain seasons and districts it prevails as an epidemic, and is very fatal in its effects. During certain seasons, and particular localities, it is so uniformly prevalent and fatal that many physicians suppose it to be carried by the attendant from one patient to another.

From the most minute examinations into the cause and nature of this disease I have not been able to detect any condition or symptom that is not occasionally found in cases of malignant inflammation of the uterus, peritoneum, and other internal organs. The disease then being of a malignant form, the questions arise, What are the causes of the disease, and why does it prevail as an epidemic?

Having had large opportunities to make observations, I have been able to learn that child-bed fever in nearly every case attacks persons who areof a scorbutic habit; or, in other words, those who have been deprived of a sufficient quantity or quality of succulent vegetables, from the lack of which the blood has become vitiated, and the entire system exhibits that condition which is known as land scurvy or purpura, in all cases of which this condition of the system exists. The gums become spongy, the digestion impaired, bowels irregular, urine scanty and high-colored, etc. This condition of the system not only manifests itself in feeble vital and physical forces, but the crasial state of the blood produces in the venous capillaries a species of capillary phlebitis, or a diseased condition of the minute venous vessels. During labor, this vitiated and impoverished blood is forced into the minute vessels of the uterus and peritonæum, and occasionally into other organs. The result is that they have no power to unload themselves when labor is over, nor can the uterus expel or throw off the effete matter remaining in it. After the expulsion of the fœtus and secundines, a rapid disorganization of the congested vessels occurs, and mortification and death follow.

That this scorbutic condition of the system exists previously to, and at the same time that the epidemic of child-bed fever prevails,

only requires observation to confirm. That child-bed fever will not occur if this puerpural condition be removed previously to child-birth, can be shown by the most ample testimony. This hemorrhagic or purpuric condition may be removed by a free use of fresh vegetables, fruits, tonics, chalybeates, pure air, baths, etc.

Symptoms.—The symptoms of child-bed fever are somewhat various, as the disease manifests nearly every degree of intensity, from a very mild sporadic form, to the most severe epidemic. The usual symptoms are, weight and soreness in the lower part of the abdomen, accompanied by lassitude and debility, capricious appetite, imperfect lochia, spongy condition of the gums, constipated state of the bowels, and scanty and high-colored urine. These symptoms will usually continue for two or three days after delivery, when the patient will be seized with chills and rigors, which may be so slight as scarcely to be observed by the patient, or, on the contrary, so severe as to amount to a regular ague-shake. These rigors and chills are soon followed by a hot and pungent condition of the skin, pain in the head, loss of appetite, nausea, and, in some cases, vomiting. The pulse becomes hard and quick, respiration hurried and irregular, the secretions are arrested, the urine is scanty and high-colored, the tongue is clammy and covered with a white coat, and in the course of a few hours the pain becomes concentrated in the lower portion of the abdomen, and is very severe. The bowels are tympanited, or bloated, and very tender, and the discharge of the lochia and the secretion of milk suppressed. In some cases the mind becomes affected, and often there is delirium. Especially is this the case in the latter stage of the disease. If the disease be allowed to continue, symptoms of great prostration manifest themselves, and in the course of a few days mortification and death close the scene. In other cases, inflammation assumes more of a chronic form, resulting in effusion into the abdominal cavity, and terminates as described in another part of this work, under the head of empyema.

Treatment.—The most salutary treatment during the first stage of this disease, is to give a free podophyllin and cream of tartar purge, followed by aconite or veratrum to control the fever. In the selection of the fever remedy, the attendant should be governed by circumstances. If the fever be of a high grade, and the patient of

a full plethoric habit, veratrum is the remedy—but if the vital powers be feeble, and the fever of an adynamic type, use aconite. In connection with the above remedy, hot packs should be applied to the bowels, and the vagina frequently injected with warm slippery elm emulsions, by means of a female syringe. If the lochia be scanty or suppressed, a warm mustard poultice should be applied to the breast, followed by hot packs covered with oiled silk or flannel. As soon as the bowels are evacuated, and the other conditions have been attended to, the patient should take quinine and muriate tincture of iron, from three to five grains of quinine every two or three hours, alternated with from ten to twenty drops of muriate tincture of iron. The quinine and iron should be continued for twenty or thirty hours, and then omitted for a short time, to be repeated in a few days, unless the symptoms become mitigated. During the treatment, the patient should be allowed lemon juice, fresh fruits, and vegetable soups.

Where there is tendency to gangrene, in addition to the quinine and iron, one or two grains of baptisin, in a tablespoonful of wine and yeast, may be given three or four times a day—also, charcoal and yeast poultices should be applied to the bowels.

If the mustard poultice and hot packs applied to the breast do not produce a return of the lochia, one or two grains of senecin, and a wine-glassful of strong infusion of cotton root, should be given two or three times a day. If there be extensive fetid discharge following the use of these remedies, as there frequently is where the uterine capillaries are very much diseased, the powers of the uterus should be supported by bebeerine, macrotin, and phosphate of iron. If there be violent pain and nervous prostration, lupulin and gelsemin are the remedies. As already stated, where the disease proves obstinate, the quinine and iron should be repeated. The bowels should be kept regular, and the skin thoroughly cleansed from day to day, with soda water. The above treatment, together with such other remedies as may be indicated by the complication of the disease, has been most triumphantly successful when all other remedies have failed.

ABORTION.

Abortion, (*abortio*,) signifies the expulsion of the fœtus from the uterus, before it is sufficiently developed to maintain independent life. When the product of conception is expelled between this period and the full period of pregnancy, it is called premature labor. The causes of abortion may be either natural or violent. Among the most prevalent causes, are mercury, bleeding, constitutional syphilis, either in father or mother, small-pox, sudden and violent excitement of the blood vessels by surprise, anger, &c. Abortion may also be caused by disease or death of the embryo, disease of the secundines, or direct violence to the abdomen, &c., &c. In addition to these causes, there is a variety of medicines used by professional abortionists, such as spurred rye, turpentine, oil of tansy, savin, &c. Mechanical means are also resorted to for the purpose of rupturing the membranes. These means are mostly used to produce criminal abortion, and are not only disgraceful to persons employing them, but criminal in the eye of the law of our country, and of God. What is termed the normal cause of abortion, is by no means unfrequent in this result.

Symptoms.—When abortion occurs in the early stage, the patient feels languid, uneasy, and despondent, and is troubled with chills, alternated with flashes of heat; there is nausea, palpitation, pain in the back, and tenderness over the abdomen. The breasts become flaccid, and there is more or less hemorrhage. In the more advanced stage, the pains are more severe, and frequently the hemorrhage is violent, so much so that in many cases, unless proper remedial agents be employed, the life of the patient is jeopardized.

Treatment.—Females who are predisposed to abortion, should carefully avoid every variety of active purgative, and all diuretic medicine, also violent exercise, and should take one or two cold sitz baths every morning on rising, followed by brisk friction, with a crash towel: also take one tablespoonful of the mother's cordial three times a day. Or if the cordial be not at hand, take five or ten grains of triturated aletrin, and one or two grains of triturated bebeerine instead. The patient will also find much relief by placing a wet pack over the lower portion of the abdomen, securing it firmly by a bandage, passed around the body. Pain may frequently be arrested by giving one or two grains of the triturated

hyoscyamin, every two hours, alternated with hamamelin. To check hemorrhage, give five or ten drops of the oil of erigeron, or fleabane, every ten or fifteen minutes until it is arrested. If this should not accomplish the desired effect, give five or ten grains of capsicum, in connection with one or two grains of matico. If, in spite of all these remedies and such other means as the judgment of the attendant may devise, the tendency to abort be still persistent, and the indication be that the ovum is detached from the uterus, the patient should drink a strong decoction of cotton root, gossypium herbaceum, every fifteen or twenty minutes, until the fœtus is expelled;—or if this should fail, the feet should be placed in warm water, and a warm mustard poultice then be applied to the breasts. After bathing the feet, the patient should take a warm sitz bath, and drink freely of warm pennyroyal tea, in connection with the cotton root. At the same time, the oil of erigeron should be given to control the hemorrhage. After the fœtus is expelled, much care should be observed, until the placenta is removed. If this should not occur in a few days, the treatment should be the same as for the expulsion of the fœtus, using the same remedies to arrest the hemorrhage. During convalescence, the bowels should be kept regular, and small doses of precipitated carbonate of iron in connection with bebeerine and rhusin should be given to maintain the patient's strength, and to prevent uterine weakness, which so frequently results from this cause.

DISEASES OF THE FEMALE BREASTS.

During and after pregnancy the mammary glands, which in the virgin state are small, soon become very much enlarged by the new movement of the system, which always exists in pregnancy. In some cases they become inflamed and painful. This also frequently occurs previously to menstruation, and I have seen several cases of abscesses occurring, in the breasts, both during the earlier stages of pregnancy and menstruation. Such is the relation between the breasts after puberty and the ovaries and uterus, that whatever affects or produces changes in one, causes more or less disturbance of function in the other.

Inflammation and Abscess of the Breasts.—Inflammation of the breasts does not differ materially from inflammation of other

tissues, save the more general influence upon the nervous system, owing to the extensive communication of the breasts with the great nervous centres. In inflammation of the breasts the capillaries become over-loaded, and the vessels being weak, the blood accumulates, until finally the inner coats become diseased, the blood stagnates, and actual inflammation is said to exist.

Symptoms.—The constitutional symptoms of inflammation of the breasts are shivering, pain in the head, loss of appetite, constipation, high-colored urine, and quick pulse.

The local symptoms are swelling, redness, and pain in the breasts. If the inflammation be allowed to continue, a deposit of sero-purulent fluid will occur in the cellular structure, and by its constant pressure upon the adjacent tissue, becomes absorbed, and an abscess is formed, which, sooner or later, opens and discharges.

Causes.—The causes of inflammation of the breasts are various, such as cold during lactation or nursing, accumulation of milk in the breasts, injuries, diseases of the uterus, scrofulous diathesis, &c., &c.

Treatment.—The first thing to be attended to in the treatment of inflammation of the breasts, is to subdue local inflammation, and to remove constitutional symptoms. To do this, make the following local application:—Take one ounce of arnica flowers, one half ounce of lobelia leaves, and two ounces of hops. Make a strong decoction, and apply cloths wrung from it hot as the patient can bear. Repeat this operation every fifteen or twenty minutes, until the swelling disappears. At the same time add ten drops of aconite to one half tumbler of water, and give the patient one teaspoonful every half hour to keep the skin moist. If there be constipation, from one half to one grain of podophyllin, and one dram of cream of tartar, may be given to open the bowels. If there be debility, or if the patient be of a scrofulous diathesis, the cathartic should be followed by quinine and precipitate carbonite of iron, and general tonics, such as chamomile, Indian hemp, pipsissewa, and precipitate carbonate of iron, made into bitters by adding wine, or one half wineglassful of Beach's wine bitters, may be given three times a day. If, in spite of all efforts, suppuration should take place, the breasts should be opened, and the following poultice applied:—Take pulverized slippery elm, pulverized hemlock bark,

and pulverized arnica flowers, equal parts, put them in warm soda water, and apply to the breast warm, and change as occasion requires.

If inflammation of the breast occur after child-birth, the following lotion is almost a specific:—Take camphor gum, half an ounce; table salt, one ounce, good whisky, one pint; beef's gall, one dram. Mix, and apply to the breast as soon as the swelling and pain commence.

SORE NIPPLES.

One of the most troublesome and common difficulties connected with the breast, after child-birth, is soreness of the nipples.

Cause.—The most common cause of this difficulty is a want of cleanliness on the part of the mother and child. The child is frequently applied to the breast before its mouth is thoroughly cleansed, and after suckling, the milk is too often allowed to coagulate and sour upon the nipple, thus proving a source of great irritation.

Treatment.—The treatment of sore nipples consists in washing with warm soap and water, after each nursing of the child, and sprinkling the nipple with superfine flower of hemlock bark.

The child's mouth should be washed before applying it to the breast.

If this treatment should not effect a cure, the following ointment may be used:—Take balsam of fir, one dram; white wax, two drams. Melt the wax and fir together, then add ten grains of equal parts of tannin and bayberry. Apply this ointment to the nipple as often as necessary, and wash previously to each application. In the absence of this ointment, the nipple may be bathed in an infusion of sumach and hemlock bark. Cover the nipple with folds of linen during the intervals of nursing. A wash of borax and sage has also been used for sore nipples to good advantage.

CAKED BREASTS.

In some cases, where the lacteals, or milk-vessels, are weak, or from other cause diseased, the milk accumulates in them, and produces inflammation, swelling, and suppuration.

Treatment.—Apply hot packs, and change them frequently; and

between each application, the breasts should be bathed in equal parts of lime-water, sweet oil, spirits of camphor, and oil of monarda, or horsemint. The stomach and bowels should be regulated, and any constitutional disturbance receive attention.

PUERPERAL CONVULSIONS.

Symptoms.—The symptoms of puerperal convulsions very closely resemble epilepsy, and are usually, though not always, preceded by more or less pulmonary symptoms; such as pain in the head, slight vertigo, and load and pressure about the epigastrium, and in some cases, nausea and vomiting. Also, numbness in the limbs, and flashes of light before the eyes, sometimes occur as premonitory symptoms of the above difficulty. In other cases no premonitory symptoms whatever occur, and the first thing observed is, that the patient's eyes are set and rolled upwards in the socket, with rigidity of the muscles, frothing at the mouth, protrusion of the tongue, &c. These symptoms frequently disappear in a few minutes, but sometimes they continue for an hour or more. When these convulsions appear, they are apt to be repeated until the cause is removed.

Causes.—The causes of puerperal convulsions are various. But the more common cause is pressure of the fœtus on the sacral plexus nerves during parturition, or an injury inflicted resulting in convulsions after child-birth. Another cause is congestion of the capillaries of the brain during labor. They may also be caused by irritation or pressure of the uterine or vaginal nerves, injuries and congestion of the spine, &c.

Treatment.—If convulsions be caused by pressure upon the sacral nerves, the head of the fœtus should be at once elevated. In the absence of proper instruments, the head of a large spoon may be used for this purpose, placing it under the child's head, and elevating it until it passes the lower strait of the pelvis. If this cannot be done, the child should be delivered at once by means of the forceps. At the same time, give the patient eight or ten of the intermittent drops, until the paroxysms are subdued. If the convulsions be caused by irritation of the vagina or uterine nerves, gelsemin and hyoscyamin are the remedies. If caused by congestion of the brain, the ligature should be applied to the arms and thighs; at the same

time the tincture of veratrum viride should be given, in five or ten drop doses, every fifteen or twenty minutes, until the paroxysms are relieved. The after-treatment should consist in tonics, baths, &c.

DISEASES OF THE OVARIES AND OVIDUCTS.

Acute ovaritis may be caused by violence, sudden suppression of the menses, caustic applications to the os uteri, and gonorrhœa.

Symptoms.—The symptoms are, dull aching pain in the groin and inner part of the thighs; frequent desire to micturate, with scanty and high-colored urine; fever; rapid pulse; nausea; and sometimes vomiting. In some cases the inflammation extends to the colon, producing tenesmus and bloody discharges. It seldom terminates in suppuration. When it does, however, there are rigors; a feeble pulse; a red tongue; excessive nausea; with throbbing and tenderness in the lower part of the abdomen. If the abscess opens into the vagina or rectum, relief soon follows; although the pus may re-accumulate, and the case prove troublesome. If it opens into the peritoneal cavity, active peritonitis will ensue.

Treatment.—Hot packs should be applied, and frequently changed. The bowels should be opened with leptandrin and neutralizing mixture; and aconite or veratrum given to control the fever. If an abscess should point into the vagina, it may be opened with the trocar; or if the active symptoms are controlled, and there are still indications of the existence of pus, iodide of potassium, and small doses of podophyllin may be given with a view to promote absorption. It sometimes terminates in the chronic form, in which event there is a dull, continuous aching in the ovarian region; tenderness in the upper portion of the thigh, and a tenderness of one or both breasts; together with occasional attacks of hysteria and nymphomania. The treatment consists, in addition to that recommended in the acute form, of iodide of potassium, cod liver oil, hypophosphite of soda, and pepsin.

Ovarian dropsy is considered in the section on dropsy.

DISEASES OF THE FALLOPIAN TUBES.

These canals are liable to chronic and acute inflammation, dropsy, hypertrophy, and atrophy. The symptoms peculiar to acute and

chronic inflammation, are deep-seated pains in the groins; sterility; nervous irritability; loss of appetite; and tenderness on pressure. Dropsy is of very uncommon occurrence. The treatment consists of such constitutional remedies as will control inflammatory action, and support the system generally.

SECTION XIV.

DISEASES OF CHILDREN.

In the different sections, we have fully described all the diseases peculiar to children, except that of difficult dentition. The only essential difference in the treatment of children from that of adults, is in the quantity of medicine administered. In children, from birth to one year of age, the dose should be almost infinitesimal. Frequently from one-twentieth to one-fiftieth of the dose recommended for the adult, is all that would be required for the child. From one to ten years, the quantity may be slightly increased; but the full dose of the medicine should not be administered until after the age of puberty. Medicines for children should also be palatably prepared. Fluids can be properly diluted with water or simple syrup, and solids thoroughly triturated with large quantities of sugar. The diet, too, is another special feature; as not unfrequently the secretions of the breast are so deficient in milk corpuscles as to render it entirely inadequate to nourish the child. In this event, cream, diluted with water and sweetened cow's milk, goat's milk, or a strong rice coffee, with equal parts of gum Arabic water, may be used as a substitute. In the sickness of children, all solid food, nauseating and irritating drugs, should be carefully avoided. Blisters, mustard plasters, irritating liniments, and every thing which tends to chafe the surface and induce nervous excitement, should be prohibited.

DIFFICULT DENTITION.

Few children pass through the process of dentition without more or less suffering, and often a variety of complicated symptoms make

their appearance, all depending upon one general cause, viz: dentition. It has long been observed, that children who pass through the period of teething early, suffer less than those whose teeth are longer in making their appearance.

The ages at which children cut their teeth are various. There are instances of children being born with full sets of teeth, as is recorded of Richard the Third and Louis Fourteenth. In general, however, the teeth begin to appear between the age of six and eight months. The two centre incisors of the lower jaw, are commonly cut first, and are soon followed by those of the upper, after which the two lateral incisors of the lower, and then those of the upper jaw, make their appearance. Between the twelfth and sixteenth months, the intergrinders of the lower jaw appear, and next in succession are the cuspides or eye teeth. The others soon follow, so that by the age of two years the child has its complete set of teeth, twenty in number. The formation of each tooth goes on in a membranous and vesicular sac, which is firmly united to the gum. It is supposed that in tedious and difficult dentition, the sac becomes more vesicular, and is materially thickened. This, together with the pressure of the teeth upon the gums, is supposed to be the only cause of the various ills incident to this period.

The teeth are composed of phosphate and carbonate of lime, fluoride of calcium and cartilage.

On analysis by Berzelius, they were found to be composed of cartilage and vessels, 28.0; phosphate of lime, 64.3; carbonate of lime, 5.3; phosphate of magnesia, 1.0; soda with chloride of sodium, 1.1. According to Lessaigne, it appears that, as the teeth become older, there is an increase of the phosphate of lime, and a corresponding diminution of the carbonate. From the above facts, it seems the food should contain these elements, to enable the teeth to become perfectly and timely developed. The cause of the diseases so frequently identified with dentition, is a lack of the proper histogenetic material, thereby causing a drain upon the other tissues, which, together with the long-continued irritation of the teeth upon the nerves, produces a train of morbid symptoms, which are attributed to any thing but their true source.

The child, under these circumstances, becomes restless, fretful

and feverish, the sleep is disturbed, the bowels are irregular, the face is flushed, and in some cases there is slight spasmodic twitching of the muscles, and in others general convulsions.

Sometimes the child becomes troubled with an irritable cough, with wheezing, a hot skin, quick pulse and scanty urine, denoting great irritation of the bronchial and pulmonary tissues. Cutaneous and glandular affections often occur. The sub-maxillary glands are those most commonly affected. Occasionally there is inflammation of the eyes, causing purulent ophthalmia.

The enumeration of the above symptoms will show the importance of a correct diagnosis in these cases.

Treatment.—There is no disease in which the ordinary treatment proves more mischievous than in this.

The poor child has its gums scarified and mutilated to no purpose. In some cases its stomach and bowels are entirely destroyed by the drastic doses of calomel, rhubarb, prepared chalk, and the like; while in others, opium, paregoric, Godfrey's cordial, Bateman's drops, and a long catalogue of irritants and narcotics, tending still farther to depress the feeble vitality of the child, cause dropsy of the brain, tabes mesenterica, and tuberculous consumption. Now these medicines have not one particle of the aliment needed to build up the structure which is making such extensive drains upon the other tissues, and causing such derangement of the vital powers. The scarifying of the gums frequently produces an irreparable injury to the teeth, by denuding them of their soft enamel; an injury seldom repaired. Hence the frequent premature decay of the teeth. The proper treatment consists in administering in small quantities those elements of which the system is deficient. For instance: take phosphate of lime, twenty grains; carbonate of magnesia, ten grains; phosphate of iron, five grains; simple syrup, three ounces. Dose, one teaspoonful three or four times a day. If there be fever, a few doses of aconite, given at intervals of from half an hour to an hour, will be sufficient to control it. If the disease prove persistent, or assume a periodical character, quinine may be given in combination with some of the other articles, or alone, as indicated. If bronchial irritation be the prominent symptom, two or three drops of the tincture of veratrum may be given every three or four hours until the symptoms subside.

If there be diarrhœa, neutralizing mixture, with small doses of geranin, should be given. The surface should be frequently bathed, and the diet should be nutritious and of easy digestion. The lime, magnesia and iron should be continued from time to time until dentition is complete.

Many cases might be adduced to illustrate this mode of treatment, but one will suffice.

In June, 1855, I was called to see a child fourteen months old, in which the teeth had not made their appearance.

The doctor had pronounced it to have pneumonia. It had been afflicted with alternate diarrhœa and costiveness for three months, and on two or three occasions had had convulsions. Its gums had been lanced eight or ten times. I immediately ordered magnesia, lime and iron, with small doses of quinine, and a good diet, and in three weeks the constitutional difficulties had disappeared, and the teeth began to make their appearance. In the course of six months, by the occasional use of the above remedies, the teeth were fully developed, and the child restored to perfect health.

SECTION XV.

GENERAL DISEASES.

MYALGIA.

There are but few subjects connected with medicine that have been so imperfectly studied as diseases of the muscles. These important organs of locomotion constitute a large bulk of the soft tissues of the body, and perform a most important function, and, like other tissues, are subject to important changes, especially during active excitement. There are but few who have not experienced the fatigue and soreness of muscles in various parts of the body. For instance, a man takes a long walk, and overtaxes the muscles of the legs and hips. He experiences fatigue, and in some cases severe pain, which he attributes to rheumatism or neuralgia, when the truth is, that this lameness and fatigue are produced by a disordered condition of the muscles. Females, who are not in the habit of sweeping, after exercising with the broom for a short time, experience soreness and pain in the muscles of the arm, breast, and back. This is especially the case if the patient be of a scrofulous or phthisical habit. Mechanics, of feeble muscular development, are liable to attacks of myalgia in the muscles constantly exercised; and in some instances the pain becomes so severe and harassing, that it disqualifies them for their business. If they apply to a physician, their disease is pronounced rheumatism, and they are subjected to a course of drastic and debilitating treatment, which invariably renders their condition worse. There are but few

physicians of experience who have not encountered numerous cases of this kind. The pain in the shoulders, so frequently attributed to diseases of the liver, as well as the lumbago, or pain in the back, which is supposed to depend upon prolapsus uteri and other female disorders, is frequently a pain produced by fatigue and the exhausted state of the muscles.

Pathology.—Upon examining the minute structure of the muscles, by means of a microscope, after violent exercise, many of the fibres will be found ruptured, the muscular striæ separated, the capillaries fraternized, and the blood extravasated into their substance.

Symptoms.—The symptoms of myalgia are heavy, aching pains, experienced in various portions of the body. These pains are always aggravated upon exercising the muscles, and subside, to a greater or less extent, after rest. There are usually but few constitutional symptoms outside of a sensation of languor, lassitude, and general debility.

Diagnosis.—The diseases with which myalgia is liable to be confounded, are rheumatism and neuralgia. From the former it may be distinguished by its being confined especially to the muscles, while rheumatism is a disease of the serous tissues of the joints. From the latter it may be distinguished by the persistent character of the pain, while neuralgia always occurs in paroxysms.

Treatment.—The treatment of myalgia consists in rest of the muscles, and such tonic remedies as are known to give strength and power to these organs. A patient afflicted with myalgia of the back, shoulders, breast, abdomen, or limbs, should be ordered to avoid all exercise which tends to fatigue the muscles diseased, and as often as every hour recline upon a sofa, bed, or lounge, for ten or fifteen minutes, for the purpose of obtaining rest. At the same time hydrastin and iron should be administered internally, and the diseased muscle frequently bathed in pure alcohol. There is no remedy in the materia medica which exerts so powerful an influence over the muscles as does hydrastin. It gives tone, vigor, elasticity and strength to these organs, in a most remarkable degree. My plan of administering this remedy consists in triturating one dram of hydrastin with one dram of iron by hydrogen, making twenty powders, and giving one three or four times a day. If the myalgia be

dependent upon a scrofulous or tuberculous habit, as it frequently is, in addition to the treatment for myalgia, the patient should be treated as directed under the head of these respective diseases.

Young females, about the age of puberty, are occasionally subject to myalgic pains, especially in the back, abdomen, and limbs, which are frequently mistaken for symptoms of the return of the catamenia. Such cases are easily cured by rest, nutritious diet, iron and hydrastin. I have also frequently seen confirmed cases of constipation of the bowels, and dyspepsia, dependent upon a weak state of the muscles of the intestines and stomach, and have cured them with iron and hydrastin, when all other remedies have failed.

A lady, who was recently under my treatment, was subject to violent spasms of coughing, after taking exercise. Anti-spasmodics and anæsthetics only afforded temporary relief. Judging the case to be myalgia of the respiratory muscles, I ordered bathing the chest with alcohol two or three times a day, frequent rest, and the liberal use of hydrastin and iron. This treatment was soon followed by permanent relief.

GOUT.

This disease affects various parts of the body, causing much inflammation and irritation. It was formerly known by the name arthritis. It is most properly divided into three varieties—*acute*, *chronic*, and *nervous gout*. Added to these is a form of the disease, which, showing symptoms of rheumatism, is known as *rheumatic gout*, and may be considered as a distinct variety.

Acute Gout.—This form generally affects persons in middle life, and of vigorous habits. The principal seat of this form of the disease is the great toe. It is often very severe, the part affected having the sensation of being torn by an instrument, or pierced. The joint soon commences to swell, becoming so intensely sensitive that the slightest motion occasions the most extreme pain. The pain, after remaining from six to twenty-four hours, diminishes, while the swelling augments. The febrile symptoms commence at about the same time with the other affections; also continuing for a similar period, and both leaving before the appearance of the swelling. At this time the patient is frequently troubled with

looseness of the bowels, or a free discharge of the urine. Gout may occur, however, in other forms. The patient may be affected with slight preliminary attacks, before the disease fairly sets in. The symptoms are almost identical with those of *nervous gout*, and will be described under that head. It is seldom that the patient is released with one attack of acute gout. It generally re-appears in about one year, although the interval may be prolonged to a much longer time. These intervening periods shorten, while the length of the attacks increase. During these attacks, the patient may be affected with inflammation in the bowels, stomach, brain, heart, &c., when the disease is said to have passed from the acute to the chronic form. When this form passes from the outward surface to the anterior organs, without any visible signs of its existence, it is termed *misplaced gout*. It may be caused by the application of cold to the affected part.

Gout may appear in two forms in the stomach; the inflammatory and the nervous. The symptoms of the former are similar to those of acute gastritis. In the nervous, or functional form, the burning pain of the former is absent, while there are either nausea and vomiting, or a severe convulsion, depending upon the seat of the irritation.

When the bowels are the parts affected, it occasions colic, or diarrhœa. Although the heart is seldom the seat of acute gout, sharp pains, an oppressive feeling, and swooning may occur. Should the lungs be affected, there will be a feeble pulse, difficult respiration, and bronchial congestion. In affections of the diaphragm, the symptoms are the same as those of rheumatism of this part. The liver is affected when there is a superabundance of bile, causing bilious vomiting, &c.

The kidneys are more generally acted upon than the other internal organs. There being an abundance of uric acid in the urine, symptoms of gravel appear. In some instances, the disease settles upon the urethra and mucous membrane of the bladder, producing symptoms analogous to gonorrhœa. At other times the disease attacks the brain, producing apoplexy.

Chronic Gout.—Chronic gout is but a continuation of the acute of long standing; or it may be denominated chronic when

the gouty symptoms appear, unaccompanied with fever. In this form, as well as in the acute, the disease may fix upon a certain joint; or it may be migratory, changing from joint to joint. In the majority of cases, however, it locates upon a single joint, and produces permanent enlargement, which consists in extensive chalky concretions.

NERVOUS GOUT.—Nervous gout, although in some instances distinct from that affecting other parts of the body, is usually connected with it. When it is of a purely nervous character, it is manifested in the form of neuralgic pain in different parts of the body. It is usually accompanied by a marked disturbance of the circulation, and of the secreting organs. Another form of gout, that has been described by many authors, is *rheumatic gout*. This form usually manifests itself by symptoms analogous to those of acute rheumatism.

Causes.—It is supposed that gout is, more frequently than other diseases, of an hereditary character. It may also be produced by high living, excessive use of alcoholic stimulants, and a want of sufficient exercise.

Diagnosis.—The only disease with which gout is likely to be confounded, is acute rheumatism; from which it may be distinguished by the more extensive disorder of the digestive organs, and its existence in patients of indolent and plethoric habits.

Treatment.—The primary object in the treatment of this disease, is the regulation of the patient's habits. His diet should be of a simple character, and composed largely of vegetable matter. Out-door exercise, and daily baths, should also be enjoined where the circumstances will permit it. The constitutional treatment should consist of a free lobelia emetic as often as once or twice a week, succeeded by the following compound:—Take apocynin, twenty grains; quinine, fifteen grains; chimaphilin, twenty grains; sacch. alba, one dram. Mix, and make twenty-five powders. Dose, one every three or four hours. If there be much pain, let the patient take the one-sixteenth portion of a grain of aconitin, and the one-eighth of a grain of hyoscyamin once or twice a day. At the same time let the following liniment be applied:—Take chloroform, two ounces; tincture of aconite, two drams. Mix, and apply to the part by

means of a small brush. If there be febrile symptoms, let the patient take small doses of the tincture of veratrum viride as often as it is necessary to control it. If the gout assume a chronic character, let from one-half pint to a pint of the strong infusion of queen of the meadow and pipsissewa be drank during the day. If there be nervous symptoms, a pill composed of one or two grains of lupulus and cannabis sativa, taken three or four times a day, will usually relieve it; and if there be enlargement of the joints, a liniment composed of equal parts of the compound tincture of myrrh, capsicum, lobelia, and oil of hemlock, rubbed on three or four times a day, will be found beneficial. When the gout partakes of the nature of rheumatism, either the sulphate or chlorate of potassa should be freely administered, in combination with eupatoreum purpurin, barosmin, and other diuretics. If the disease be of a periodical character, and especially if it return at stated intervals, the attacks should be anticipated by the free use of quinine and podophyllin. During the treatment the entire body should be sponged in a hot alkaline bath as often as once or twice a week. Mineral acids, and sulphite of soda, may also be used in this disease.

RHEUMATISM.

Acute rheumatism is generally ushered in by a quick, bounding pulse, a hot, dry skin, foul tongue, loaded urine, and more or less severe pain in different portions of the body. In many cases these symptoms are preceded by rigors and chills, followed by a fever, which in a short time subsides, and a sour perspiration takes its place. In the course of a few days the pain fixes upon one or more of the joints, which become red, full, and painful. Unlike ordinary inflammation, the pain frequently changes from one joint to another. The inflammation of the joint is not always, although sometimes, accompanied by exudation and infiltration of liquor sanguinis into the cellular tissue. In many cases, when the disease is transferred to a distant portion of the body, all traces of inflammation in the previous site disappear in a very few hours. This, however, does not occur as a general thing when the inflammation is accompanied by an exudation into the tissue. In some cases the disease appears to be confined to the synovial membrane, and an exudation occurs within the sac, producing *hydrops articulorum.*

The disease may run its course without involving any of the vital organs, or it may locate upon the pleura, peritonæum, pericardium, and other portions of the serous tissue. In this event the symptoms will become more complicated, and the disease of a more dangerous character. This acute form of rheumatism, when not involving the vital organs, under favorable treatment, terminates by critical evacuations, such as copious acids, perspiration, diarrhœa, or large deposits of urates in the urine. In other cases the disease terminates in chronic rheumatism, which consists in permanent enlargements of one or more of the large joints accompanied by much swelling, pain, and a general thickening and consolidation of the articulating tissues, with all the essential characteristics of gout, as I have already previously described.

Causes.—It is a prevailing opinion that rheumatism is, in some way, the effect of cold, exposures, dampness, &c., and that these exposures and influences result in an inflammation of the serous tissues, especially those of the joints. That the inflammation connected with rheumatism is of a very different character from ordinary inflammation, requires but little observation to confirm. Who ever heard of an ordinary inflammation changing its locality almost instantly? and yet this is a most ordinary occurrence, during the progress of inflammatory rheumatism. Nothing is more common than for a rheumatic inflammation to leave one joint, or section of serous tissue, and fasten upon another, within the space of three or four hours, and that, too, without leaving any traces of the disorder in the tissues where it was previously located. Besides, rheumatic inflammation seldom, if ever, pursues the same course as that which characterizes the ordinary inflammatory process. Ordinary inflammation, it will be remembered, is always accompanied with exudation, and a variety of consecutive changes in the exudation, such as the formation of pus, abnormal tissues, or the death of the exudation. All these are most essentially different from those changes which occur in rheumatic inflammation. Again, it is not those who are the most exposed to cold, fatigue, and dampness, who are the most frequent subjects of rheumatism. In the Western country, during its early settlement, I had ample opportunity to observe the effects of colds and every variety of exposure, especially those which are supposed to be most prolific in

producing rheumatism; yet, not only did these causes fail to produce the disease, but when rheumatism occurred, which was seldom, it was far more amenable to treatment than when it occurred among those who enjoyed all the luxuries and comforts of life. Indeed, it is among this latter class that we find rheumatism most prevalent and most violent. Hence, in consideration of the facts connected with this disease, we must infer that rheumatism is produced by other causes than those which ordinarily contribute to inflammation, and that it must depend upon some specific poison, or *materies morbi* existing in the blood. Of the characters of this poison, Drs. Todd and Prout state that in the blood of rheumatic patients a superabundance of lactic acid is found. Dr. C. J. B. Williams, in his Principles of Medicine, remarks that rheumatism is probably produced by a specific poison in the blood, and suggests that this may be lactic acid. That this substance should contribute to this disease, when existing in the blood in large quantities, is no more unreasonable than that other foreign acids and substances, when circulating in the blood, should contribute to special inflammations.

Treatment.—Basing my treatment upon the hypothesis that lactic acid is the principal cause of rheumatism, my first efforts are to cut off this supply to the blood. Lactic acid, it must be remembered, is generated to the amount of twelve or thirteen pints in the stomach during twenty-four hours. But during healthy digestion it is neutralized by the ingesta. If the digestion become disordered, instead of this acid becoming neutralized, it may be taken up by the absorbents, and thus the blood becomes loaded with this agent. To prevent this, our first purpose should be to correct the digestive organs; for which purpose a free lobelia emetic should be given, followed by frequent doses of chlorate of potassa, in combination with diuretics. It must be remembered that lactic acid is transformed into uric and lithic acid during its passage through the kidneys. Hence the value of diuretics. In addition to this, one or two hot alkaline baths should be given every day; and where there is local inflammation, the parts should be kept constantly packed in cloths wrung from a strong solution of potassæ. As soon as the emetic has operated, the bowels should be thoroughly opened by compounding ten grains of sulphate of quinine with one dram of antibilious physic, and two grains of podophyllin; dividing it into

six powders, and giving one every hour, until free purging ensues. This should be followed by a thorough alcoholic vapor bath. If the rheumatic affection be not controlled, five or ten grains of sulphite of soda may be administered every two or three hours, in connection with one dram of the fluid extract of hydrangea, or the compound extracts of pareira brava or barosma. When the disease has become chronic, two drams of iodide of potassium may be added to six ounces of cannabus sativa, and one teaspoonful given every two or three hours. Sulphur vapor baths also have a beneficial influence in this form of the disease. As often as every five or six days, a full round of quinine and iron should be continued during the entire treatment, and the diet consist mostly of vegetables.

NECROSIS, OR CARIES.

The bones, as well as the soft parts, are liable to inflammation, ulceration, necrosis, or death and exfoliation.

Symptoms.—When inflammation of the bones occurs in an acute form, there is usually pain, frequent and hard pulse, with marked derangement of the nervous system. When the disease assumes a chronic form, the pain is more of a heavy, aching character than in the acute. In most cases where the disease assumes a chronic character, it is either connected with a syphilitic, mercurial, or scrofulous taint; or appears in one who has taken a large amount of iodide of potassium; or it may be the sequel of acute inflammation, arising from colds, rheumatism, periostitis, &c.; or it may be the result of metastatic, syphilitic, mercurial, or scrofulous diseases. Necrosis of the bone frequently occurs as the result of deficiency of osseous tissue in the food—hence it is more frequently met with among the poor and ill-fed than others. Wherever necrosis occurs, and whatever cause may contribute to it, exfoliation and discharge of bony matter are its symptoms.

Treatment.—The general treatment consists in supplying the system with plenty of material for bony tissue, and the thorough cauterization of the diseased bone.

The following compound I have found most effectual as an internal remedy in necrosis:—Take phosphate of lime, one-half ounce; common table salt, one-fourth ounce; carbonate of iron, one-fourth ounce; the white of six eggs. Mix, and add one pint of best port

wine. Let the patient take from one-half to one wine-glassful three or four times a day. The bowels should be regulated by neutralizing mixture, and leptandrin or euonymin, and the surface frequently bathed in lye water. The diet should be nutritious. The practice of giving alterative syrups, with iodine and potassa, in all cases of bone disease, I believe to be fraught with evil; unless there is some abnormal deposit to be absorbed. The object of the treatment is not to increase the molecular changes of the part by alteratives, but to prevent such abnormal alterations by the use of tonics and antiseptics. Hence, quinine, hydrastin, oil of tar, macrotin, cerasein, pipsissewa, chamomile, poplar bark, balmony, iron, wine, and porter, are among the class of remedies to accomplish the desired purpose in necrosis. The bone should be thoroughly cauterized with caustic potassa, or the sulphate of zinc, followed by the fir and zinc ointment, and stimulating liniments of alcohol, oil of hemlock, origanum, amber, sassafras, &c., &c. If the adjacent soft tissue should be inflamed, elm poultices, hot packs, &c., are among the most radical means of subduing it. The simple and compound syrups of ceanothus americanus, and the syrup of lycopodium clavatum, or club-moss, are also valuable remedies in necrosis.

HIP DISEASE, OR MORBUS COXARIUS.

The cause of hip disease is the same as of necrosis, of which it is one variety, viz.: falls, dislocation and bruises of the hip joint, and scrofulous, mercurial, or a syphilitic taint.

Symptoms.—Although the symptoms of hip disease are very marked, it is often mistaken for other diseases.

A case occurred in my practice of a little girl who had hip disease, but who had been treated for rheumatism. This mistake arose from the fact that the only complaint the child made, was of pain in the knee.

In this disease, the pain is nearly always foreign from the real seat of the disease; hence, the patient complains of pain in the thigh, knee, foot, &c. Deformity of the limb is an early symptom, as it will be very considerably turned inward, the knee frequently resting against the other. Acute pain may be caused in the hip by pressing the thigh bone firmly upwards. The sleep will be disturbed, the bowels irregular, appetite capricious, and in some cases

there will be hectic fever, and night sweats. The hip will swell, become painful, and entire loss of the use of the limb follow.

In many cases, the membrane around the head of the bone will become so diseased as to pour out a large quantity of muco-purulent matter, or sero-purulent fluid, filling the joint, and causing the head of the bone to leave the socket, thereby producing still greater deformity, as in this case the limb is not only turned inward, but dislocated, and much shortened. In some cases the short tissues become red, swollen, and inflamed, and suppuration occurs near the point of the disease; while in others, the pus which is formed around the joints, passes along the fascia of the thigh, and makes an opening down the leg. I have attended several cases of hip disease, where, in this way, a large number of openings were formed along the limb from the hip to the knee. The constitutional symptoms vary according to the nature and cause of the disease. In some cases they are very slight, while in others, night sweats, diarrhœa, hectic fever, &c., are prominent symptoms.

Treatment.—The most effectual treatment in the early stage of hip disease is very simple. A large irritating plaster should be placed over the entire hip, and caused to remain until a thorough counter-irritation is effected, and a discharge occurs. When the discharge ceases, the plaster should be again applied, and renewed from time to time until the disease is entirely removed. The internal treatment should consist of mild purges, frequent baths, phosphate of lime, salt, iron, and tonic syrups. Where the disease is connected with a scrofulous constitution, the syrup, or compound syrup of hypophosphites, should be given in two or three dram doses three or four times a day. Where the disease is more advanced, and the openings have occurred, they should be thoroughly cauterized, and covered with the fir and zinc ointment. The entire limb should be bathed with alcohol four or five times a day, to which is added a moderate quantity of camphor and oil of hemlock. If there be much swelling, a poultice should be applied, composed of equal parts of slippery elm, pulverized hemlock, and Peruvian bark, after the liniment and over the liniment, and changed as often as necessary to keep the parts moist and the ulcer clean. In many cases the cartilages and ligaments become entirely destroyed by the ulcerating process. In this event the limb should be placed in a natural position, and entire rest absolutely enjoined; as the

only hope of a cure consists in inducing a deposit of bony material around the joint, in quantity sufficient to induce anchylosis. This can be accomplished by administering wine, malt liquors, vegetable tonics, chalybeates, and a nutritious diet. The capillaries of the part should be excited and stimulated; for this purpose, the hip should be frequently bathed in the following liniment:—Take alcohol, one pint; oil of capsicum, one dram, oil of hemlock, two ounces; Croton oil, ten drops. Mix, and bathe frequently.—Also take equal parts of syrup of hypophosphites, and the syrup of chimaphilin, three or four times a day. Dose, one tablespoonful.

If there are open sores with cicatrized edges, they should be injected with a solution of sulphate of zinc, and filled with pledgets of lint smeared with zinc ointment. The limb should be thoroughly bandaged, and supported with splints. Where the head of the bone or acetabulum is decayed, the following injection will be found invaluable:—Take sulphate of iron, one ounce; phosphate of lime, two ounces; water, one pint; dissolve the zinc and iron in the water, and add twenty grains of tannin. Inject with a small syringe three or four times a day. Bathe the limb with an infusion of bitter herbs in alcohol, followed by brisk friction to keep up the circulation. As soon as the patient can walk, gentle exercise in the open air should be taken, and a strict course of diet and regimen pursued until entire recovery is effected.

WHITE SWELLING, OR HYDRARTHRUS.

White swelling, in its proper acceptation, occurs most frequently about the middle period of life, but is, however, very often seen in children. There is a difference in its approach in these periods; you will never see a case of white swelling under the age of puberty, without a deviation from health, but not always so when it makes its appearance in after life. Its approach is slow, is accompanied with pain, the patient is only aware of any thing wrong by a stiffness in the motions of the part, and when in the knee joint, (which is the most common seat of the disorder,) the patient walks badly, with the knee bent.

In this insidious way it may go on for several weeks, but on looking at it, you perceive that the natural points of the joints are obliterated, that it is swollen, and has become more rounded than

the sound one, while the natural color of the integument remains unchanged, as the name of the disease would mark as one of its distinguishing characteristics. In some months, or it may be years perhaps, an abscess forms, and may open near the joint or at some distance from it, even so low as the middle of the calf of the leg, and a quantity of curdy matter is discharged, without at all reducing the swelling of the joint, however: after a time this opening may heal and another form, which will in its turn continue to discharge.

White swelling of the knee is usually of a chronic nature, but sometimes, as in morbus coxarius, it is acute, when it runs its course in as many weeks as in the chronic form it would have taken months to do. In the chronic form, the joint is swollen before any pain is felt; but in the acute case, motion of the limb produces excessive pain before there is any swelling, except perhaps a little fulness from an increased secretion in the joint. The fluid poured out in these cases, does not seem like healthy synovia, but as if it were a mixture of it and serum.

White swelling might be confounded with other conditions of the joints; sometimes the large bursa above the patella, between the extensor muscles of the leg and the lower part of the femur, becomes inflamed, and fluid is poured out by the sac, and as this bursa often communicates with the general synovial cavity of the knee-joint, it might be mistaken for white swelling, but it is very easy to distinguish them; in the case of enlarged bursa, there is no pain in moving the femur and tibia on each other, and if you make the patient extend his leg by the action of its extensors, the figure of the swelling is altered: there will be a hollow made in its middle by the pressure of its muscles and patella. Neither of these will be the case if it be white swelling. Sometimes, after using a good deal of exercise, or taking a long walk, there will be pain in the knee and effusion into the joint. This might be mistaken for white swelling; but the difference in the approach of the two is, that in white swelling the pain comes on long before the effusion, while in the other case they come on together. There is one marked distinction between white swelling, and other diseases of the knee,—a symptom that never fails to point out the nature of the case clearly,—and it is this:—in white swelling the flexor tendons of the leg are not promi-

nent as they naturally are, but the hollow in the popliteal space is filled up to their level. In forty-nine cases out of fifty, the position in which you will find the leg is flexed or semi-flexed on the thigh, and lying on the outside; but in the fiftieth it may extend as straight as possible, and rest on the head, and the patient cries out with pain, if you attempt to move the limb: yet put the patient sitting on the right side of the bed, or on a table, and you may not only flex the limb, but swing it backwards like a pendulum, without giving him any uneasiness.

Patients laboring under this disease seldom complain of any pain in the part, but rather a sense of uneasiness,—a feeling as if it were tired,—as if the bones entering into the articulation were not rightly bound together. There is, however, pain in the limb, going upwards towards the abdomen, which they call rheumatic pains, and it is useless to try to persuade them that they are not rheumatic.

There are cases of white swelling met with, where neither the patient nor his friends can assign any reasonable cause for its appearance. Some cases have their origin in exposure to cold or damp, apparently, and several are found to come on during convalescence, after fevers of various kinds; some are attributed to the sudden recession of eruptions; but there must evidently be a predisposition to the disease in the constitution or the part, or we must discredit many of the agencies said to induce the affection.

Treatment.—When white swelling first makes its appearance, by a proper course of medication it may be arrested at once. In the commencement of the disease, bathe the parts in a liniment made as follows:—Take oil of hemlock, four ounces; dissolve as much camphor gum in it as it will take up, and add twelve drops of Croton oil, and three drams of tincture of iodine. Bathe the limb thoroughly, after which apply hot cloths wrung from a strong infusion of equal parts of arnica flowers and lobelia; change as often as they grow cool. With each change of the cloths apply the liniment. The patient should take a purge of antibilious physic, followed by a free use of the compound syrup of chimaphila and phosphate of iron. Take of the compound syrup of chimaphila, one pint; phosphate of iron, three drams. Dose, three or four tablespoonfuls a day. The patient should be bathed three or four times a week, in strong soda water, and a nourishing diet allowed. If this course be adopted,

and persisted in, it will arrest the disease in the first stage. But where it is farther advanced, and openings are formed into the bone, they should be enlarged by means of caustics, or a free incision. Ointments and poultices should be applied, as directed in treatment of hip disease. The constitution should be well supported by means of tonics and antiseptics. The limb should remain perfectly at rest, and the motion of the joint prevented by means of splints. In an indolent condition of ulcer, and a discharge of sanious matter, inject it with a strong solution of vegetable caustic, or sesqui-carbonate of potash; then take pulverized phytolacca decandra, one ounce; scrofularia marilandica, two ounces; pulverized myrrh, two ounces; flaxseed meal, one pound. Mix, and wet with equal parts of soda water and lobelia tincture sufficient to make a poultice, and apply warm. The poultice should be changed, and the ulcer injected as often as once or twice a day.

Equal parts of Beach's alterative syrup, and the compound syrup of helianthus, given in tablespoonful doses, three or four times a day, will be found of much value, in connection with iron, hydrastin, ampelopsin, and other remedies given as indicated. Where the bone is diseased, it may be treated as already directed in necrosis and hip disease.

HECTIC FEVER.

When fever arises as the result of phthisis and scrofula, it is called *hectic*. It occurs in nearly all forms of diseases connected with great debility. In surgical practice it is very frequently met with in cases of disease or injury of the joint, and where there is great constitutional debility, and where pus, after having decomposed, is introduced into the blood.

Symptoms.—In surgical hectic, the symptoms are never as prominent as they are in consumptive or scrofulous subjects, yet they are sufficiently so to indicate the true nature of the disease.

In hectic fever, one of the first symptoms is usually wandering pains in the limbs like rheumatism, in some cases being of the most acute and torturing character.

In one case of hectic fever which came under my notice, caused by the formation of pus in the uterus, the premonitory symptom was acute pain in different parts of the body, of a neuralgic charac-

ter, appearing in regular paroxysms, and lasting four or five hours. In other cases, the pain amounts only to a mere aching of the bones, accompanied by a feeling of languor and lassitude, very much resembling incipient ague. As soon as the fever is fairly set in, the pains mostly leave.

The first symptoms of hectic may be unnoticed; it is so irregular in the occurrence of its paroxyms, that in any six days of its duration, there will not be three in which the paroxysm will happen at the same hour.

The patient at first only feels a little weakness; he is conscious of not being able to use as much exertion as usual, and his friends remark that he does not look as well; he rapidly loses flesh, yet his appetite may be good, and his functions regular. It is soon perceived that once or twice a day he has a change. About noon a shivering comes on, and lasts perhaps for half an hour, during which he looks pale, and his countenance drawn in; after this the warmth returns, and the heat soon increases beyond the standard of comfort, particularly in the palms of his hands, etc., which have a peculiarly biting, hot feel. There is nothing in this cold and hot stage of hectic like the corresponding symptoms of most other fevers. He may, without arousing any particular attention in his attendants at the incident, get his chair drawn nearer to the chimney, have the fire stirred, and have something wrapped round his feet; by and by he complains that the fire is too brisk, moves away from it, has a screen interposed, causes the door to be left open, and that's all. Sometimes the chilliness returns during the hot stage, or there comes on the sweating stage, (which, in hectic, is not a general full perspiration over the whole body,) and on its subsidence, leaves the patient pretty well until the next attack, which usually comes on about six or seven o'clock in the evening. The sweating is seldom perfect; it is generally over the chest and arms, but sometimes on the lower extremities alone; it is not like that in some others, but a greasy kind of moisture. As the disease progresses, the patient loses flesh and strength, the appetite declines, the tongue continues clean, but redder than natural; the mind becomes easily excited, the pulse is about ninety—seldom gets as high as one hundred and twenty; the countenance changes; the forehead seems larger from the falling off of his hair; the eyes have a pearly

white appearance, and sometimes are peculiarly brilliant; he flushes often, or there is a circumscribed redness on one or both of the cheeks; the nose is drawn in, and the finger nails become incurvated. A colliquative diarrhœa generally occurs in the morning, and when this is the case, he sinks rapidly—not, indeed, as some imagine, from the consequences of the diarrhœa itself, but from the extent to which the fever has arrived. He will complain of a slight sore throat, perhaps, and, on examination, a number of white specks, called aphthæ, are seen on the soft palate, or perhaps on the tongue, or under the tongue, or, what is more frequently the case, there will be seen a large ulcer in the throat.

In the beginning the hectic has intermissions, more or less perfect, but it soon becomes remittent: that is, never entirely subsiding. In some surgical diseases, as cancer, this fever presents few of its prominent characters well marked, such as you might observe, for instance, in extensive disease of a joint. In some diseases you will see one symptom, as the diarrhœa, almost alone; in others the sweating, and so on: in fact, there is a great variety in its appearance and course.

As the disease becomes advanced, night sweats usually take the place of the fever, and in many cases the night sweats are consecutive upon, or may be alternated with it. Whenever this occurs, the patient usually sinks rapidly, and, unless relieved, will succumb to the disease in a short time.

Treatment.—The treatment of hectic depends much upon the cause or causes which give rise to it. When it is dependent upon disease of a local character, the local disease should be treated in connection with the constitutional. If caused by confined pus, if the pus be so situated as to be discharged, it should be done.

The internal remedies consist entirely of antiseptics and tonics. Among the best antiseptics used for hectic, is strychnin, in doses of from one-tenth to one-eighth of a grain. The preparation of B. Keith & Co., is the best that I have ever used. Also, one-half to one drop of hydrocyanic acid three or four times a day, in combination, or in alternation with phosphate of lime, or in connection with the tonic pill, or the compound wine bitters as recommended. In some cases, Beach's wine bitters may be used. For the fever, aconite may be used in connection with warm baths and cooling

acidulated drinks. If there are night sweats, give the following:—Three tablespoonfuls of strong sage tea, and five drops of nitro-muriatic acid, every two or three hours during the day. The surface should be bathed every night in a strong solution of salt and water, followed by a cold bath in the morning, and brisk friction, until a complete reaction is produced. The patient should be allowed a liberal amount of brandy, wine or porter, three or four times a day, with exercise in the open air, and as strong diet as the stomach will tolerate. Creasote, in one or two drop doses, in connection with hypophosphite of soda, iron and potassium are also valuable. Prof. James McClintock highly recommends sulphurous acid in connection with the compound tincture of gentian; two or three drops of the acid in the gentian to be taken three or four times a day. Cod liver oil and champagne wine, in the proportion of one-half dram of the oil to one ounce of the wine, taken three or four times a day, has also proved a remedy of great service. The diarrhœa can be controlled by an enema of a strong decoction of comptonia asplenifolia, mixed with a half dram or dram of the tincture of opium. Prof. I. G. Jones strongly recommended the strychnos Ignatia or St. Ignatius bean, in doses of one-half to one grain of the hydro-alcoholic extract, to be taken three or four times a day.

DISEASES OF THE MUSCLES, TENDONS AND BURSÆ.

The muscles may become rigid, producing various deformities and displacements of the joints and limbs. Thus, a long continued disease of the knee may result in a permanent contraction of the flexor muscles of the leg.

Treatment.—Contracted muscles may be relieved by bathing, friction, and electricity. A very good liniment for this purpose is the following; take oil of lobelia, one ounce; oil of hemlock, two ounces; oil of olives, one ounce; and oil of monarda, two ounces; mix, and apply with a great deal of friction, three or four times a day. If this should not succeed in removing the deformity, galvanic currents may be passed through the limb once or twice a day. If these means should fail, some of the extension splints should be applied, and the leg put upon the stretch, or penotomy be restored to.

RUPTURE OF THE MUSCLES AND TENDONS.

Violent exertions sometimes result in rupture of the muscles and tendons. These injuries are best treated by perfect rest, and such measures as will subdue the inflammatory action.

ANCHYLOSIS.

Anchylosis or immobility of the joint is a disease which frequently results from violent injuries and disease of the parts. It is best treated by stimulating liniments, brisk friction, local steam baths, and extension splints and bandages.

INJURIES OF THE SPINE.

Lateral curvature of the spine presents many varieties, and may be caused by debility of the muscles, or by disease of portions of the spinal column.

Symptoms.—Elevation of one shoulder, a projection of one of the scapulæ, and, on examining the spine, it will be found to present a curvature to one side or the other.

Treatment.—Attention should be paid to the position of the patient; the spine frequently bathed in stimulating liniments, and from one to two teaspoonfuls of the compound syrup of hypophosphites given two or three times a day, in connection with vegetable tonics. The patient should indulge in plenty of out-door exercise, and the diet be nutritious. In some cases benefit may be derived from the use of shoulder-straps or other support to the abdominal and spinal muscles. Cod liver oil, iron mineral acids, salt water bathing, and galvanism may also prove beneficial.

POTT'S CURVATURE OF THE SPINE.

Pott's curvature of the spine consists in an angular curvature produced by caries of the body of the vertebræ, or ulceration of the inter-vertebral substance. It is mostly confined to scrofulous children. It begins with weakness, and symptoms of spinal irritation, coldness of the extremities, twitching and spasm of the legs, which is frequently followed by palsy. If the disease be confined to the dorsal vertebræ, there will be tightness of the chest

and difficulty of breathing. If to the cervical, one or both arms may be paralyzed.

Treatment.—Rest and horizontal posture are indispensable in the treatment of this disease; and the spine may be supported by placing two splints along the back, on each side of the curvature. The splints should be secured so as to make a tolerably firm pressure on each side of the curvature. This method brings the pressure directly in contact with the weak point of the vertebræ. The splints should extend the entire length of the spine. Two narrow strips of tolerably firm steel answer the purpose very well, an irritating plaster should be applied over the diseased portion, and caused to maintain a discharge for several weeks. The body should be bathed once a day in alkaline water, followed by friction, and from one to two tablespoonfuls of the syrup of rock rose; or the compound syrup of frost-wort given in combination with one or two grains of ferri-hypophosphite and soda hypophosphite, two or three times a day. The occasional use of quinine, hydrastin, and chimaphilin, will also be found beneficial. Cod liver oil, Mecca oil, iodide of potassium, and iodide of ammonia, may also be used.

ABSCESS.

The term abscess implies a collection of pus in any tissue of the body. They are divided into eight varieties, viz.: acute and chronic, hot and cold, lymphatic, diffused, metastatic, and puerperal. They are formed by the secretion of purulent matter from inflamed capillaries, confined by a wall formed by the effusion of coagulated lymph which consolidates the surrounding tissues, and prevents a diffusion of pus.

Symptoms.—In acute or phlegmonous abscess, the part will be inflamed and swollen, with a throbbing, pulsating pain: as the pus accumulates and approaches the surface, the part becomes soft and fluctuating. As the abscess advances, some portion of the swollen surface becomes more prominent, and more or less livid. In the majority of cases, suppuration takes place, giving exit to the hitherto confined pus. In rare cases, the swelling disappears by the inspissation of pus.

Chronic abscesses are formed by some gland, or some portion of

the subcutaneous cellular tissue becoming irritated, and frequently with not very prominent constitutional symptoms except swelling. They soften and discharge a curdy, puriform fluid; or they frequently extend along some fascia, or burrow deeply into the adjacent tissue, and remain a long time without opening. The cold, or lymphatic abscess, mostly occurs in persons of a scrofulous habit, and appears in the iliac, fauces, groin, or axilla. The patient usually feels but little uneasiness, and does not suffer much pain, but suddenly finds a large, fluctuating tumor in some of the parts mentioned above, which, in some cases, opens, but more frequently remains indolent, and manifests but little disposition to suppurate. If opened, it will be found to contain a large quantity of thin, unhealthy pus. A diffused or puerperal abscess occurs mostly in women, after confinement, in various parts of the body, commonly in connection with phlebitis, or inflammation of the veins. They may be from a pin's head in size, to an abscess capable of holding a pint or more of pus. These abscesses may form in any part of the body, but are most numerous where there is the greatest number of absorbent glands. The pus formed in these abscesses is liable to gravitate and accumulate in the more dependent portions of the body, producing disturbance of the circulation, &c.

Treatment.—The indication to be fulfilled in the treatment of abscess, is to prevent the formation of pus—to evacuate it when formed, and to heal the parts, so as to prevent a farther secretion. To prevent its formation, all irritating substances should be removed, such as pieces of dead bone, &c.; cold packs applied, with alkaline baths to the surface, followed by brisk friction. The bowels should be moved freely by a purge of anti-bilious physic, and cream of tartar, or podophyllin; tonic and alterative syrups given, and a free use of diuretics, such as marsh-mallow, cleavers, eupatorin, purpureum, &c. If, notwithstanding these means, it is evident that pus is about to form, the treatment should be changed. Warm flax-seed or elm poultices, wet with the tincture of arnica or lobelia, should be applied to the part, and changed frequently. The patient should take, of equal parts of the syrup of chimaphilin and balmony, one tablespoonful four or five times a day; also, small doses of precipitate carbonate of iron and lupulin, three or

four times. The surface should be frequently sponged in warm lye-water, and the diet nutritious and easily digested.

When pointing occurs, the pus should be discharged. There are three ways by which this may be accomplished: by incision, by tapping with the trocar, and by making an aperture in the cyst with caustic. In acute abscess, the incision is preferable. It should be made either at the point where fluctuation is most distinct, or at the most dependent position of the abscess, by passing a sharp-pointed bistoury or lance into the tumor a sufficient depth to reach the pus. After the abscess is evacuated, it should be injected with warm soap-suds, followed by a strong solution of myrrh and tincture of arnica.

In chronic abscess, the opening should be made by means of caustic potassa. Should the bone be diseased, the abscess should be injected with a strong solution of phosphate of lime, alternated with the sulphate of iron, and that of zinc. The patient should take phosphate of iron, chloride of soda, and quinine. If the abscess occur in the extremities, and be connected with a scrofulous diathesis, the part should be supported by a bandage, frequently wet with a strong solution of salt and water, and the system well supported by tonics and antisceptics.

A valuable syrup in these cases may be made as follows:—Take chimaphila umbellata, or pipsissewa, two ounces; chamomile flowers, one ounce; rock-rose, two ounces. Make one pint of syrup, and add ten drops hydrocyanic acid. Dose, one tablespoonful three times a day.

As to the treatment of chronic abscesses, Druitt remarks, "If the abscess be so large that the exposure of its cavity would lead to the evil consequences that have been enumerated, or if it be connected with disease of the spine, or other bone, (as in case of psoas abscess,) the following plan should be resorted to with a view of inducing a contraction of the sac, and of diminishing the danger from a permanent opening. Should one be established subsequently, a small puncture should be made at the most depending part of the tumor. It may be made valvular, by drawing the skin a little to one side before introducing the bistoury; but this is not of much consequence. As much matter as flows spontaneously should be permitted to escape, and then the puncture should be carefully closed

by lint and plaster, and the patient be kept at rest till it is healed. During the flow of the matter, the greatest care ought to be taken to prevent the admission of air into the sac. At the expiration of ten days, or a fortnight, when it is nearly refilled, a second puncture should be made, (but not too near to the former,) and be healed again in like manner. This operation should be repeated at the proper intervals, taking care never to let the abscess become so distended as it was before the previous puncture, and using moderate support and bandages in the intervals. Thus, in fortunate cases, these repeated, partial evacuations, combined with proper constitutional measures, will cause the abscess gradually to contract, so that it either becomes completely obliterated, or degenerates into an insignificant fistula. This method of treatment was introduced by the late Mr. Abernethy. He, however, recommended as much as possible of the matter to be evacuated at each operation, instead of allowing it to run spontaneously; which latter method is much better calculated to preclude the admission of air, and avoids all irritation of the cyst by rough handling or squeezing."

But if air has gained admission into the cavity of the abscess, and the pus has become putrid, and prostration of strength, and dry, brown tongue, show their influence on the system, then the indications plainly are, to make free openings and counter-openings, so as to prevent all lodgement of the putrid pus; and to wash out the sac occasionally with injections of warm water, containing a very little of the solution of chloride of soda. At the same time the general treatment of pyemial fever must be re-adopted, and the strength supported by wine, nourishment, opium, &c.

PSOAS ABSCESS.

Psoas abscess most commonly occurs in the early period of life, and is generally connected with diseases of the spine, and confined to scrofulous constitutions. It is developed either in the sheath or psoas muscles, and is preceded by rigors, chills, lumbago, and general constitutional debility. It generally presents itself below Poupart's ligament, in the form of a tumor, while the patient is in an erect posture, which disappears upon lying down.

The treatment for psoas abscess, is that which is recommended under the head of chronic abscess.

MAMMARY ABSCESS.

The various changes that occur naturally in the condition of the uterus, are not unfrequently accompanied by sympathetic affections of the female breast, either natural or morbid. Some of the latter may be considered at present; others, when we speak of particular diseases that the breast is liable to in common with other parts.

There is one affection of the breasts of women which mostly occurs after parturition, but sometimes before it, called *mammary* or *milk* abscess. It generally occurs within a month after parturition, but it may appear three months after. It is ushered in with a rigor, which is succeeded by heat, sweating, thirst, and other febrile symptoms. There are many circumstances which may induce a rigor in a female at this period; but if it is to end in mammary abscess, you will find, on examining the breast, that the patient is able to point out one particular spot which is very painful, though nothing at the time may *appear* to show what is to follow. If the disease be left to itself, it is very slow in its progress—it will take, perhaps, a fortnight or three weeks to come forward. Even when it bursts, the patient says she is better, and really seems to be doing very well, as the painful distention is relieved, and the fever generally subsided, you will have to suffer the disappointment of finding another abscess forming in some other part of the gland, or even in the other breast.

While this suppurative process is going on, the secretion of milk is diminished, the infant's endeavors to obtain nourishment give considerable pain, not only in the affected breast, but even drawing the sound one is productive of much uneasiness, and the consequence is a greater accumulation of milk, which adds to the distress.

The contents of these abscesses are pus, and often milk mixed with it. Sometimes the *entire* breast will be found to be inflamed, and gets considerably larger and harder than that of the opposite side, and is accompanied with high inflammatory fever; the patient suffers much more than in the preceding case, and its course is generally more rapid. Now, here it is not the substance of the gland itself that is affected, but the cellular substance between it and the pectoral muscle, and this form is called an *encysted mammary abscess.* Occasionally there will be a case of this kind which will have given little local or constitutional uneasiness until the matter has

come nearly to the integuments, and this it does by making its way through the substance of the gland.

Causes.—It may be produced by using the arm too much when the breast is distended with milk; or if strong local measures be employed to put back the milk without proper attention to other treatment; or by mental anxiety, great depression or excitement, and by colds.

Treatment.—The treatment in the early stage consists in keeping the breast thoroughly wet with equal parts of the tincture of arnica and lobelia, by saturating pads of cotton in this mixture, and reapplying them as fast as they become dry. The bowels should be opened by means of small doses of neutralizing mixture and antibilious physic, and the fever controlled with aconite. If the breast should be very painful, tincture of aconite or opium may be added to the mixture for local application. If, after the application has been made for twenty-four hours, there should still be symptoms of suppuration, a poultice composed of equal parts of pulverized slippery elm, flaxseed, and bayberry, moistened with warm water to the consistence of a paste, should be applied, and kept constantly wet with equal parts of the tincture of arnica and opium. As soon as pointing occurs, or an accumulation of matter exists in sufficient quantity to warrant the operation, the abscess should be opened, and contents discharged; after which, the breast should be injected with a small abscess syringe, three or four times a day. The best preparation for this process, is a warm decoction of hydrastis canadensis. The poultice may be continued, and the breast thus treated until the cure is effected. Or, if the abscess should assume a chronic character, it should be injected once or twice a day with a mild solution of sulphate of zinc. The internal treatment should consist of vegetable tonics, iron, and nutritious diet.

PARONYCHIA.

There is an abscess, which is usually found at the ends of the fingers, called *paronychia*, or *whitlow*, of which there are some varieties, chiefly owing to the seat. When there is only a little collection, like a spot of milk, appearing just under the cuticle, all that is necessary is to cut the cuticle from about this, or puncture it, and it becomes well of its own accord. When the matter forms

under the whole thickness of the skin, or under the nail, the nail will inevitably fall off; but, after all, this is the worst that can happen here. The third kind, commonly called the *malignant*, is a much more serious disease. A man will go to bed quite well, but soon after he feels a dreadful pain in the top of one of the fingers, which keeps him in torture the whole night. In the morning, when he looks at his finger, there is nothing to be seen; very quickly he is seized with the inflammatory fever, as it is technically called—that is, where the pulse becomes much quicker, but with less strength. Sometimes the pain is so intense as to cause delirium; and yet after all, nothing is *seen* in the finger itself that could account for this disturbance. So high does the fever become occasionally, that patients have died of it, and others have only been saved by amputation. Often, if left to himself, the patient has a sensation as if the pain and tension were creeping up the arm; it shifts first to the middle joint of the finger, perhaps; some time afterward he will tell you the pain is all in the palm of the hand; it next passes the annular ligament of the wrist. I have sometimes opened abscesses in the middle of the forearm, which began in this way. When the pain is in the palm of the hand, an opening made into that region will give exit to very little matter, and the relief is but temporary. This form of paronychia is in the sheath of the tendons; between this strong fibrous membrane and the periosteum, and it always makes its way where the sheaths are weakest, as in the cleft between the fingers. When whitlow breaks, it heals rapidly, but with, perhaps, the loss of a finger; or the joints may become anchylosed; or the hand itself may become stiff and useless; sometimes, where the joints of the finger do not become anchylosed, you can feel the ends of the phalanges, grating on each other, being deprived of their cartilages; and the bone itself, after a time, appears to be absorbed. Something extraordinary certainly does take place, for you feel the top of the finger perfectly soft, with nothing hard about it, but perhaps a bent, ill-formed nail; or the middle phalanx may disappear, leaving the extreme one quite movable, as if only hanging by the integuments. The first and second kinds of whitlow are found generally in those who work much at their needle; the third is often observed in sailors, and others who are much employed in pulling ropes.

Treatment.—The treatment for the milder form of paronychia consists in applying a solution of nitrate of silver to the part, of the strength of fifteen grains to an ounce of water. The best method is to wrap the finger in soft lint, and keep it constantly wet in this solution, which will usually cure it in from twelve to twenty-four hours. In the more severe form, where the disease commences on the bone or the periosteum, the finger or hand should be laid open by making a long and deep incision to the bone. As soon as the bleeding is over, the wound should be injected with a strong solution of sulphate of zinc, and kept saturated with equal parts of tincture of lobelia and opium. If there be much inflammation, a slippery elm poultice may be applied, and kept moistened with the above wash. If there be constitutional symptoms, they should be treated according to their nature and severity. The practice of applying rotting poultices to this affection is very objectionable, as it not only jeopardizes the use of the hand, but, in some cases, the life of the patient.

GANGRENE AND MORTIFICATION.

Gangrene and mortification may arise form a variety of causes, such as intense inflammation, arrest of circulation, severe contu-

Fig. 43.

sions, compressions, certain specific poisons, etc. It may also occur spontaneously in old people, when it is called *senile*, and is usually owing to a disease of the coats of the arteries; see fig. 43.

Symptoms.—The symptoms of gangrene and mortification are both local and constitutional. The local symptoms are death of the part, followed by sloughing and deep ulceration, unless it be dry gangrene, represented in the Figure, which dries and becomes very hard. The constitutional symptoms depend much upon the extent and nature of the gangrene. If it be dependent upon active inflammation, and great debility of the parts, there will be feeble vitality, loss of appetite, great prostration, and if the gangrene be internal, there will be hiccup, vomiting, cold sweat, and death. But where the disease is confined to the extremities of the body, they correspond with the extent of the injury.

Treatment.—Where there is a tendency to gangrene in any of the internal organs, quinine, capsicum, baptisin, yeast and other stimulants and antiseptics, should be given in such quantities as are necessary to maintain the vitality of the parts. In external gangrene, poultices, made of pulverized indigo weed, sweet fern, Peruvian bark, slippery elm, and yeast, should be applied, and changed every hour or two. If this does not arrest it, wet the poultice with the following lotion:—Take best French brandy, one pint; sulphate of zinc, one ounce. Dissolve the zinc in two ounces of water, and add to the brandy, also, two ounces of pyroligneous acid, and keep the poultice wet.

Tonics and anodynes should be administered internally. The following pill I have used to good advantage;—Take pulv. myrrh and capsicum, of each thirty grains; prunin and baptisin, of each twenty grains; ex. garden lettuce, one dram. Mix, and form fifteen pills; give from three to five per day. Give the tonic wine bitters, one half wine glass full, three times a day, and if the arteries be affected as in *senile* gangrene, small doses of iodide of potassium, in connection with Beach's alterative syrup, will be found beneficial. The diet should be as nutritious as the patient can bear, and the bowels kept regular by means of mild laxatives.

ULCERS.

An ulcer is defined by Liston to be a solution of continuity, accompanied by the secretion of pus, or other fluid. There are eight varieties: the simple, healthy, or healing; weak or sluggish; indolent; irritable; specific; varicose; sloughing, and inflamed. These

varieties are not dependent merely upon local causes, but are much modified by the condition of the constitution. The character of an ulcer is an indication of the state of the general system.

The characteristics of *simple or healthy ulcer* are a circular or oval surface, slightly depressed, studded with granulations, secreting pus, and presenting a tendency to heal. The prognosis in this variety is favorable, and the treatment is simple, consisting of water-dressings, and slight pressure with adhesive strips, or a bandage. The indications are to maintain the strength of the system, and to remove all local causes of irritation, such as the contact of air, or the friction of clothing. The black salve of Dr. Beach forms a good application. The ulcer should be cleansed with warm Castile soap-suds, and cold applications rarely applied. In the application of adhesive strips, or a bandage, care should be taken to give a place of exit for accumulating pus.

The *weak or sluggish ulcer* occasionally occurs, and is frequently caused by the continued application of emollient poultices. The granulations are semi-transparent, high and flabby, rising in large, exuberant, gelatinous, reddish-looking masses, above the surface of the ulcer. The granulations readily slough, having but a feeble vitality. The treatment of this variety should consist of constitutional means to invigorate the system, tonics, stimulants, and nourishing diet; and the local application of astringent and stimulating compounds, such as the tincture of myrrh, capsicum and geranin. An occasional ablution of the part in a solution of sesqui-carbonate of potassa, or extract of white oak bark, will be found beneficial; or sprinkling it with finely pulverized sanguinaria or alum, will be of service. Doctor Erichsen highly recommends the following formula:—Sulphate of zinc, sixteen grains; comp. tinct. of lavender, and spirits of rosemary, of each, two drams; water, eight ounces, as an astringent application. The limb or part should be elevated, and gentle pressure made by means of a roller or adhesive strips. These should be placed so as to leave a space between them for the escape of pus, and over them, lint, covered with cerate, and retained by a bandage. The water-dressing is sometimes used, consisting in the application of a piece of patent lint, of the size of the ulcer, dipped in tepid or cool water, to the part, and covering this with a piece of oiled silk, somewhat larger, and bound down by a roller.

The *indolent ulcer* is deep and excavated, covered with irregular and imperfectly formed granulations, which exude a sanious pus. The edges are hard, irregular, and rugged. The tissues adjacent are congested, and firmly adherent to the subjacent fascia. The sensibility of the part is diminished, and pain is seldom troublesome. This variety is formed by feeble capillary circulation, which may arise from a local or a constitutional cause. It most frequently occurs in men about the middle period of life, and is usually located in the lower extremities in the lower third of the leg, just above the ankle. The treatment should be such as will tend to depress the edge, and elevate the base of the sore, as stimulation and pressure. For a stimulant a poultice of slippery elm sprinkled with pulverized myrrh and capsicum will be useful. In many cases, however, this will not be sufficient, and it will be necessary to destroy the diseased edges at once, by nitric acid, or potassa fusa, or sulphate of zinc, and afterward cover the part with a poultice of slippery elm, keeping the limb elevated, and sustaining the strength of the patient; or use the following formula: Take pul. sulphate of zinc, two drams; pulv. hydrastis, one dram; pulv. podophyllum peltatum, one half dram. Mix. Fill the cavity of the ulcer with this, and let it remain as long as can be well borne, or until it has destroyed the dead tissue, then apply slippery elm, wash in cold water until the part sloughs. Then apply the lead plaster, or Beach's black salve, or the emplastrum saponis. This treatment, conjoined with proper constitutional remedies, general tonics, and stimulants and rest, will usually effect a cure. The application of pressure, however, will be necessary in cases that cannot be well subjected to the treatment described. Before this is applied, the limb adjacent to the ulcer should be stimulated with the application of the comp. tinct. of myrrh and capsicum, elevated, and steamed over medicated vapour; then the ulcer should be filled with the sesqui-carbonate of potassa, letting it remain for some hours; and then washed with a weak solution of tincture of capsicum, say one dram to one ounce rain-water. Then the emplastrum saponis should be spread on calico, which should be cut into strips sixteen to eighteen inches in length, and an inch and a half in width. The centre of the strip should be smoothly laid on the side of the limb opposite to the sore, and its ends brought

round the limb and crossed obliquely over the ulcer. A sufficient number should be applied to cover the sore and the limb for two inches above and below it. Each strip should overlap about one-third of the adjacent one, and all should be evenly and equally adjusted, so as to make equal pressure upon all parts of the diseased limb. A roller should then be applied to the limb from the toes to the knee. The lead plaster may be used as a substitute, or the adhesive, or emplastrum resinæ, although this is thought by most surgeons to be more irritating to the ulcer. The application of these strips should be renewed every forty-eight hours, and if the discharge should be considerable, holes should be made in the strips for the escape of pus.

The inspissated juice of the phytolacca decandra leaves, evaporated to a salve, forms a valuable remedy for producing a slough. Likewise that of the rumex crispus and of the sanguinaria Canadensis. These should be applied on linen cloths, until there is a line of demarkation between the diseased and healthy tissue. The ulcer may afterwards be healed by means of the black salve. Pressure may be made upon these ulcers by means of collodion. It should be applied so as to form a thick impervious covering. Its contraction by means of the evaporation of the ether produces a degree of pressure that is many times highly beneficial.

The *irritable* ulcer is most often found in females of a nervous and bilious temperament, about the middle period of life. It is usually situated about the ankle or shin, and is small in size. Its edges are not elevated, but are irregular, the surface is grayish, covered with a thin layer, and discharging a thin sanious secretion. It is quite painful, preventing sleep, and thus injuring the general health. The treatment should first be constitutional. The alcoholic vapor bath should be used twice a week, and if the stomach be inactive and digestion impaired, an emetic of lobelia will prove highly beneficial. This should be followed by the administration of tonics and stimulants; hydrastin, xanthoxlin, and euonymin, are valuable remedies for this purpose. If there be evident anæmia, iron should be administered. If the ulcer appear during lactation, especial care will be required in order to sustain the system by nutritious diet, tonics, and porter or ale. The compound syrup of stillingia, or Beach's anti-mercurial syrup, with the

muriatic tincture of iron, will be highly serviceable. Especial attention should be given to restoring the secretions of the skin and kidneys, by baths and mild diuretics. It is impossible to cure these cases unless the excretions are properly restored, and the organs of circulation properly stimulated. Pure air, good food, and cleanliness are important. Rest at night should be procured by hyoscyamin, scutellarin, and cypripedin, either separately or alone. These are preferable to opiates, inasmuch as they do not arrest the secretions.

To allay pain and irritability, a poultice made of equal parts of pulverized lobelia herb and slippery elm, with laudanum, will be useful, or the application of a thin plaster made by spreading the inspissated extract of conium on soft linen. Sometimes dry applications will be better than moist. These should consist of flour, or finely pulverized chalk, or the powder of the lycoperdon bovista. But when the ulcer resists all these means, it should be washed in a strong solution of nitrate of silver, followed by some sedative and emollient application. It may be necessary, in some cases, to entirely destroy, by means of the chloride or sulphate of zinc, the ulcerating surface, and then apply a poultice of ulmus and pulverized myrrh to favor the healing process, followed by the use of the black salve. When the granulations are spongy, and discharging watery fluid, it may be necessary to apply an astringent compound, for which purpose the extract of quercus is admirably adapted. Dusting the surface with very finely pulverized nut-galls will likewise be beneficial.

The *inflamed* ulcer is characterized by symptoms of inflammation, redness, swelling, pain and heat. The discharge is often thick, offensive, and bloody. The treatment should consist of cold applications, the elevated position of the part, and the use of poultices of ulmus, wet with cold water, and frequently changed so as to keep down the heat. At the same time, the patient, if there are symptoms of constitutional excitement, should take aconite and veratrin internally; an occasional warm bath, and a cathartic of the fluid extract of senna and jalap, or of some other effectual purgative. After the local symptoms are reduced, the constitutional and local treatment that is recommended for other varieties of ulcers will be appropriate.

The *sloughing* ulcer may be described as having a great tendency to spread, a dusky red blush forms around the sore, the edges are sharp cut, the surface grayish, and attended with irritative fever. It is usually found in persons of a cachectic constitution, and is allied to gangrene, the vitality of the part and the constitution being much reduced. The treatment should consist of a nourishing diet; the use of quinine and iron, hydrastin and other vegetable tonics; and when the constitutional powers are greatly reduced, the strongest diffusible stimulants should be used, as capsicum, xanthoxylin and carbonate of ammonia. The brandy and egg mixture will be found excellent. The local applications should be such as will cause a slough. Sulphate of zinc, and the chloride should be applied on lint, followed with slippery elm, and charcoal poultices, if the tendency to gangrene be marked. The carrot and spikenard poultice will likewise answer a good purpose.

The *specific ulcer* has characteristics dependent upon its cause, which may be scrofula, fungus, or syphilis. The particulars of each should be described under the heads of their respective causes.

The *varicose ulcer* takes its name from its cause, which is a varicose condition of the veins in the circumjacent tissues. The skin gradually undergoes degeneration, becomes of a brownish or purple color, and the veins in the part are enlarged and tortuous. Near to one of these congested spots the ulcer forms, by breaking down the softened and partially disintegrated tissue, forming a sore in which the surface is sometimes irritable, sloughing or indolent. In case the ulcer penetrates one of the tortuous veins, it gives rise to hemorrhage, which sometimes proves alarming. The recumbent posture, elevating the limb, and compression of the part by lint and rollers, will speedily arrest the hemorrhage. The *causes* of this condition of the veins are phlebitis, by destroying the valves, pressure upon the ascending cava, or upon the femoral or saphenous veins, or a want of tonicity in the parietes of the veins on account of general debility.

Treatment.—The indications are to remove the cause, if possible. The general circulation should be stimulated, and the liver excited, if portal congestion be the cause. The heart should receive attention, if it be diseased. Capillary circulation throughout the body should be increased by baths, stimulants and tonics. To the

affected part, astringents and pressure should be applied. The limb should be elevated, and a strong solution of extract of quercus mixed with French brandy used for a wash. The patient should wear a bandage applied from the toes to the knee, or even above, if the veins be distended. An elastic laced stocking will accomplish the same object. In difficult cases, some surgeons recommend passing a ligature under the vein adjacent to the ulcer, then tying it so as to cause it to slough. Care should be taken, in performing this operation, not to pierce the vein. The same object may be attained by means of the application of caustic to the vein, thus causing an eschar and slough, by which the vessel is occluded. Other remedies may be beneficially used to increase capillary circulation in the parts; as tincture of myrrh and capsicum, kino, catechu, marsh rosemary, and the various astringent remedies. The tannic and gallic acids, containing the essential elements of astringents, can be beneficially used in solution.

The *hemorrhagic* ulcer is a sub-variety, known by a dark purple sore, occurring in females, from amenorrhœa, and consequently tending to bleed most at the menstrual periods. Its cause being constitutional, the treatment should consist of the use of tonics and stimulants. Xanthoxylin, macrotin, oil savin, sulphate of iron, caulophyllin, with hip-baths, a nourishing diet, and occasional purges, containing a portion of aloes, will be effectual in restoring the catamenia. The local treatment is comparatively unimportant, and should generally be the same as that recommended for the irritable ulcer. The general principles in the treatment of ulcers of every variety are to restore the action of the organs of digestion, assimilation, and the circulation of the blood, so that their treatment should be constitutional to a great extent. Nothing can be of permanent benefit, unless the general system is in a proper condition to furnish the healing material. The local treatment should be such as will aid nature in hastening the formation of a slough, and enabling the system to cure the ulcer quicker than it would do unaided. Undoubtedly, by means of rest, the elevated position, proper diet, and the judicious use of water-dressing, the great majority of ulcers can be cured; and, indeed, in many cases these are almost the only means that can be brought to bear upon patients, on account of prejudice, or the want of faith in medicines.

BRUISES.

Bruises may be caused by pressure between two substances, by falls and other injuries that rupture a greater or less number of capillary vessels, nerves, &c., without tearing, cutting, or absolutely destroying the continuity of the parts. Slight bruises, in many instances, are quite as painful as those which are more extensive, although, from the latter, much more serious consequences are liable to follow.

Symptoms.—A bruise is usually of a dark-purple color, (ecchymosis,) owing to the escape of blood from the minute vessels into the areolar tissue.

In the course of a few hours after the bruise, the parts usually become very painful and swollen. If the injury occur to the fingers or toe-nails, they become blackened, and the pain is very severe. If the bruise be very extensive, the countenance is pale, and there are nausea and vomiting, weak pulse, anxious expression of the countenance, imperfect respiration, dull, heavy pain in the head, unless the injury be directly to the brain, in which case there will be stupor, and, in some cases, involuntary discharges from the bladder and bowels. The surface will be cold, and covered with a clammy sweat. If the bruise involves the vital organs to any considerable extent, it may very soon terminate in death. But where the injury is less severe, in a short time reaction will take place, the pulse becomes full, the skin hot and dry, with general fever, &c., &c.

Treatment.—The treatment will depend altogether upon the nature and extent of the injury. If the injury be slight, but little more is necessary than to wrap the part in cold water, and remain quiet for a short time. But when violent, the patient ought immediately to be put to bed, and the injured part kept in a hot pack. At the same time a warm cordial should be administered, or some active stimulating medicine given; as capsicum, xanthoxylin, &c. When reaction takes place, to remove the fever, aconite or veratrum should be administered, and the entire surface frequently sponged in tepid water. When the constitutional symptoms are controlled, if the hot packs have restored the normal circulation to the injured part, no further treatment will be indicated. On the contrary, if the part still presents a dark-purplish appearance, is tumid and

painful, the following stimulating poultice will be found valuable:—Take pulverized slippery elm, pulverized indigo weed, equal parts; gum myrrh, one-half part; and pulverized prickly ash, one-fourth part; wet with good brewer's yeast, and apply, changing as often as indicated. Internally, from five to ten drops of arnica, and a mild anti-bilious purge, will be all that is indicated, unless the vital organs are involved, when stimulants and tonics may be required.

The old practice of bleeding patients who have received a recent injury, is a very pernicious one, and cannot be too strongly deprecated. Its baneful effects are not unfrequently exhibited in the consumptive and scrofulous progeny of those who have been the subjects of this disastrous practice. When the nails are bruised, and the blood settles under them, much relief will be found by cutting through them, and allowing the blood to escape, afterward applying hot packs. For a wash to bathe the parts where the cuticle is not destroyed, tincture of arnica and lobelia will be found valuable. In all cases, the parts should be so thoroughly stimulated as to prevent gangrene and mortification, or the formation of ulcers, which so frequently occur as the result of bruises.

BURNS AND SCALDS.

The treatment of different cases must be varied. For a simple, superficial burn, involving the cuticle alone, almost any remedy will be attended with a successful result, so that one will have a high opinion of cold water, another of warm, another of turpentine, another of compound tincture of myrrh and capsicum, according as each has applied this or that remedy. In the vesicating burns, the roughened cuticle should be carefully handled, and applications more cautiously applied and removed, lest the cuticle be detached, and the surface beneath exposed to the air. In case there are little blebs, they should be punctured with a needle or lancet, great care being observed to prevent the ingress of air to the surface of the burn beneath the cuticle. Any application that excludes the air, and is emollient, and tends to maintain a comfortable and equal temperature, will fulfil the indications of treatment. For this purpose, the flour of slippery elm well dusted over the surface, or linen cloths, wet in warm mucilage of elm, or a thin layer of soft-carded cotton, moistened with diluted whisky, and held by a few turns of

the roller, will be useful. The warm packs of mucilage of elm are beneficial; but that application which excludes the air most completely, and with the least irritation to the part, is the best. If the burn slough, a poultice of slippery elm should be applied until it is removed. If there be fungous flesh, it may be removed by the use of pulverized sanguinaria, phytolacca, or caustic potassa.

Several other topical applications have been recommended. Starch, either wet or dry, is often used. Acetate of lead is recommended by some; but it has no advantages over the extract of quercus alba, the geranium maculatum, or the statice limonium. A solution of borax is mentioned. For a stimulating application, Dr. B. F. Hill recommends:—Take spirits of camphor and tincture of opium, of each half an ounce; spirits of turpentine, and tincture of capsicum, of each one dram; olive oil, three ounces. This preparation is most useful after the inflammatory stage has passed away. It should be applied once or twice a day, and covered with a poultice of slippery elm.

Rum and molasses are another remedy recommended by the people of the South. These substances should be intimately mixed, and applied on linen, or by saturating raw cotton; or they may be applied to the surface by means of a brush, over which is placed oiled silk, or a poultice. A mixture of linseed oil and carbonate of lead, may be applied with a swab. These various remedies are referred to, in order to show the various opinions of medical men. Nothing can better fulfil the indications than cold water, or Mecca oil. Internally, stimulants should be given, to produce reaction; and aconite, to control the fever.

CASUALTIES.

Life, when to all appearance lost, may often, by due care and energetic attention, be restored.

Accidents frequently prove fatal, merely because proper means are not used to counteract their effects. No person should be regarded as killed by accident or injury, unless some vital organ or structure is injured to such an extent as to be incompatible with life. The vital organs may be so diseased as to very much disturb their functions, or, for the time, to entirely suspend them—yet, in many cases, by proper means, these functions may again be re-

stored, and the life of the patient saved. Hence, in all cases where the faintest hope of life remains, every means should be used to restore it.

RED NOSE, OR LIPOMA.

Lipoma is a chronic enlargement of the subcutaneous and cutaneous structure of the nose, presenting a peculiar lobulated appearance, and is usually of a purplish red color.

Treatment.—Apply a strong irritating plaster until free suppuration ensues; follow with mild zinc ointment, and allow the parts to heal by cicatrization. Or the tumor may be dissected off, care being taken not to cut through the nostrils, allowing the parts to heal by granulation, keeping them covered with ointment.

NASAL POLYPI.

A nasal polypi is a soft, moist tumor of a yellowish color. Its structure is very nearly identical with that of the mucous membrane, to which it is firmly attached.

Symptoms.—One of the first symptoms of nasal polypi is the sensation of a stoppage of the nostril, which eventually amounts to a nasal respiration. When this occurs, by inspection a tumor may be observed in the nasal cavity, of a shining, grayish color. By forcing the breath through the nostril, it will be noticed to descend, and the reverse by nasal inspiration. As the polypus grows, it will press upon the neighboring parts, and cause disfiguration of the nose and face.

Treatment.—In the early stage of polypus, it may be removed by snuffing equal parts of pulverized blood-root and matico. If the tumor has become very large, it will be necessary to remove the main body by means of the polypu forceps, and afterwards use the snuff to prevent further growth. To remove the polypus with the forceps, the patient's head should be held by an assistant, and the forceps made to grasp the main body of the tumor, when by a twisting motion it can be removed. If there be hemorrhage, it can be arrested by matico.

EPULIS, OR TUMORS OF THE GUMS.

A tumor of a fibrous character often springs from the periosteum and edges of the alveolus, which forms between the teeth and loosens

them. The treatment consists in an entire destruction of the tumor by means of caustic potassa, followed by a wash of bayberry and hydrastin.

ENLARGEMENT OF THE UVULA.

Enlargement and elongation of the uvula are frequent symptoms of scrofula, consumption, and other diseases. When the uvula becomes elongated, it proves very irritating, causes an excessive secretion in the throat and fauces, and sometimes results in inflammation and ulceration.

Treatment.—It can usually be remedied by frequently gargling the throat with cold water and the following wash:—Take fluid extract rhusin, one dram; fluid extract bayberry, two drams; water, two ounces. Mix, and gargle the throat three or four times a day. Also bathe the throat upon the outside in strong salt and water. If constitutional difficulties exist, they should receive attention.

ORCHITIS, OR INFLAMMATION OF THE TESTES.

This disease may be caused by injuries, but is more frequently the result of badly-treated gonorrhœa. The symptoms are, swelling, great tenderness, and pain.

Treatment.—Hot packs, purges of podophyllin, and apocynin, followed by veratrum, iodide of potassium, jalapin, and the application of iodine to the parts, in case the disease is chronic.

HÆMATOCELE.

Hæmatocele signifies an extravasation of blood into the tunica vaginalis. It may be treated as hydrocele.

VARICOCELE, OR SPERMATOCELE.

This term signifies a varicose state of the veins of the spermatic cord. It may usually be cured by laxatives and purgatives, a suspensory bandage, and a wash of diluted muriated tincture of iron. The irritating plaster has also been applied, and afforded relief in some instances. Tying the veins and destroying them with potash has also been resorted to.

MERCURIAL DISEASE.

There is no disease more formidable in its attack upon the organic tissues than mercurial disease; not only in its tendency to develop a great variety of pathological conditions, but in the peculiar obstinacy with which it resists the efforts of the physician to arrest its progress. The only way by which the *modus operandi* of mercurials upon the organic tissues can be explained, is that by which we explain the inability of all foreign agents to produce disorganization, unless the quantity be sufficient to overpower the vis-vitæ of the part with which it comes in contact. When a foreign body is introduced into the external soft tissue, the vitality of the part is at once summoned to remove the intruder; consequently, a deposition of lymph occurs around the foreign body, which soon becomes organized in such a way as to cut off all communication between it and the adjacent tissues. Inflammation and suppuration are the agents used to expel the body; so when mercury is introduced into the system, it acts as a foreign body to every tissue with which it comes in contact, and an effort is made to expel it. When combined with chlorine, as in calomel, it may entirely dissolve the tissues, such as the mucous membrane of the stomach, bowels, lungs, etc. But whether we are able or not to account for all the morbid conditions produced by this agent, we have the most positive assurance, that in the whole catalogue of predisposing causes of disease, there is none more prolific than this.

Symptoms.—Mercurial erythema is sometimes preceded by symptoms resembling those which usher in erysipelas; as rigors, headache, a foul tongue, thirst, and præcordial pains, which continue throughout the disease, and become daily aggravated in severe cases. The only premonitory symptom, in some instances, may be a harsh dryness of the skin; and again it may appear suddenly after taking a purge of three or four grains of calomel. It may result from the administration of mercury in any form or preparation; but most frequently, however, by its use internally. It appears as a dark-red blush at some of the folds of the body, the seat of the scrotum, groin, axillæ, or anterior parts of the elbow, from which it spreads with a greater or less degree of rapidity, according to the severity of the case. It is distinguished from ordinary erysipelas by its slightly

rough surface; its edge not being distinctly defined; the intolerable itching; and its vesicular appearance when viewed through a magnifying glass.

Whenever the surfaces of the body lie in opposite contact, such as in the perinæum, the inside of the thighs, or between the folds of the nates, these vesicles break almost as soon as formed, the parts become abraded, and there is a constant oozing of a serous fluid, foul and abominably fetid. If the disease be neglected, and mercury still used, the febrile symptoms become exasperated, the eruption spreads, and may occupy the entire body, and the vesications, or rather vesicles, run into each other and break. Where surfaces are opposed, the discharge increases in quantity, assumes a puriform character, and becomes, if possible, still more offensive; when they do not, a branny scurf or scale is formed, which falls off, and is renewed so abundantly, that after the night, or even within a few hours, a great quantity may be found in the patient's bed. In general, this desquamation of the skin is attended with febrile symptoms, and the patient slowly recovers; but if otherwise, if the disease has been more than usually malignant, or if the medicine has been still persevered with, the parts engaged swell, apparently by the formation of thicker scabs or crusts, which are deeply cracked or fissured (not inaptly compared to the scored skin of roasted pork,) discharging sometimes sanies, or again blood, and so sore and painful that the patient can scarcely bear to turn himself in bed. The cough becomes very severe, and is accompanied with great soreness of the chest; the matter expectorated is sometimes highly tinged with blood, and so coagulated as to threaten suffocation. The pulse is frequent and irregular, the surface intensely hot and sore, the thirst unquenchable, the tongue parched, and black in the centre, and the urine high-colored, small in quantity, and without sediment. Diarrhœa and low delirium speedily supervene, the pulse sinks, the body mortifies, and a state of insensibility at length announces the termination of a complaint that at once exhibits a distressing proof of the inefficiency of medicine, and the insufficiency of human skill.

Treatment.—If the disease be manifested in a mild form, the patient should take a gentle purge of podophyllin, the surface then freely bathed in salt water, a mild course of tonics instituted, and

a generous diet allowed. In more severe cases, as much of the mercury should be extracted from the system as possible, by recourse to the galvanic battery, after which the compound syrup of stillingia, and small doses of sulphur, will be required. The surface should be frequently bathed in saline water, and iron and hydrastin given in doses sufficient to maintain the patient's strength. Where the disease appears to confine its poisonous action chiefly to the skin, much benefit will frequently be derived from the use of an ointment made of equal parts of tar and sulphur.

BRONCHOCELE, OR GOITRE.

Bronchocele is an enlargement of the thyroid gland. It generally commences by a moderate increase of the gland, or thickening of the neck, and advances gradually until a portion or the entire gland becomes enormously swollen. When the tumor acquires a considerable magnitude, it produces more or less dyspnœa, and sometimes obstructs the circulation to the brain.

Causes.—It is more likely to occur in females at the age of puberty, although it may be observed at any period of life. Low, marshy, and miasmatic sections of country develop it. It is also frequently associated with deranged uterine functions. In other cases, it may be dependent upon the existence of hydatids.

Treatment.—The most effectual remedies are the iodides; such as iodide of ammonia, potassium, &c., and the application of the tincture of iodine externally. The tumor may be painted with the officinal tincture of iodine every night, and two drams of iodide of ammonia added to one pint of compound syrup of stillingia, and one dessert-spoonful given three or four times a day. The iodide of mercury, formed into an ointment, and applied to the tumor, has been used instead of the iodine. I have cured a number of cases by applying the irritating plaster to the tumor, and producing a free discharge. The application should be continued for several weeks. At the same time, ten grains of chimaphilin, and one of iodide of potassium, may be administered twice a day. Strong salt packs, blisters, ice bags, and iodide of lead, have also proved beneficial in some cases. Small doses of podophyllin and quinine have been resorted to with success. In cases of debility, the syrup of iodide of iron may be administered, in combination with cod-

liver oil. Mecca oil, taken in dram doses, two or three times a day, has recently cured several cases.

CRETINISM.

Cretinism is a species of idiocy that some authors have regarded as associated with bronchocele, and developed by a peculiar miasmatic influence. We cannot, however, coincide in this opinion, as we believe that idiocy is the result of imperfect cerebral development, dependent upon certain physiological causes.

HERNIA.

A protrusion of any organ from its proper cavity is denominated a hernia. The names which have been given to the different forms are omental, intestinal, gastric, cystic, or otherwise, according to the organ misplaced. When the intestines pass down along the side of the spermatic cord in the male, and the round ligament of the uterus in the female, it is styled *oblique inguinal;* and *direct inguinal* when it passes directly through the abdominal ring.

Strangulated Hernia.—Hernia is said to be strangulated when the omentum that protrudes is so closely confined that it cannot be returned into the abdomen without a surgical operation, and where the circulation is cut off, and gangrene or mortification is liable to ensue. Strangulation occurs as the result of congestion of the protruded part, and the spasmodic constriction of the walls of the canal through which the viscus passes.

Symptoms.—When the hernia becomes strangulated, the tumor will be found increased in size, hard and tense, and, in coughing, the impulse, which is always felt in reducible hernia, is no longer perceived. The patient becomes restless, and there will be obstinate constipation of the bowels. The pulse will be full and hard, the skin hot and pungent, the tumor will assume a dark purple color, and be extremely painful, and if allowed to remain, nausea and vomiting will ensue, together with great pain over the entire abdomen, indicating active peritonitis. In the course of a day or two, if the patient be not relieved, the pulse will suddenly become feeble, the surface will be covered with cold, clammy sweat, and dark, effete matter will be ejected from the stomach, passed from the bowels, and death will ensue.

Reducible Hernia.—In all cases an attempt should be made to reduce the hernia before resorting to an operation. Every possible effort should be made to reduce the hernia by means of taxis. This should be commenced by giving from five to ten drops of the concentrated tincture of gelsemin, repeated every ten or fifteen minutes until the eyelids become heavy, which indicates the constitutional influence of the drug. Then give a strong lobelia injection, after which the thighs should be flexed upon the abdomen. The tumor should then be gently grasped with the left hand, and with a finger of the right hand the intestine gradually restored to the abdomen. If this cannot be done, the hips should be elevated, and the parts fomented with a strong infusion of lobelia, after which the taxis should be again attempted.

If these efforts are not sufficient to reduce the hernia, the bowels should be injected with warm water, and the stomach thoroughly evacuated by lobelia. I once reduced strangulated hernia, when all other efforts had failed, by suddenly elevating the patient by the feet. A plaster of belladonna is used beneficially sometimes in these cases. I have also known electricity to be used with good effect. But if all these efforts fail, an operation should be resorted to.

Radical Cure of Hernia.—Various methods have been adopted for this purpose. The following method I have found effectual, not only in curing recent cases, but those of long standing. In the first place, after reducing the hernia, it should be kept in its place by means of a truss properly adjusted to the upper portion of the inguinal ring. Previously to applying the truss, a small strip of soft leather covered with the irritating plaster, should be applied the whole length of the inguinal canal. This plaster should be renewed as often as once or twice a week, and continued until free suppuration ensues. After continuing the irritating plaster for two or three weeks, it may be removed, and the common strengthening plaster applied. If the first application of the irritating plaster does not produce sufficient inflammation to contract the inguinal canal, and prevent hernia, it should be repeated. This method I have found very successful in curing many bad cases.

SECTION XVI.

DISEASES OF THE EYE AND EAR.

OPHTHALMIA, OR INFLAMMATION OF THE EYES.

The eye is one of the most delicate, as well as one of the most complicated organs of the body. Diseases of the eye have been until recently very imperfectly understood. Thus has the patient been duped, not only in a pecuniary point, but too often mourns the loss of that inestimable organ. Ophthalmia is mostly described as a surgical disease, but considering that a large majority of cases of this class originate in some defect of the constitution, the propriety of treating upon them in a work on practical medicine will readily be perceived. Inflammation of the eye may be divided into external, or inflammation of the conjunctiva, and deep-seated or inflammation of the other tunics, including amaurosis, which is frequently produced by inflammation. This disease is again divided into acute and chronic.

INFLAMMATION OF THE CONJUNCTIVA.

The first symptom complained of in this form of inflammation of the eye, is a sensation as if particles of sand had insinuated themselves beneath the lids, accompanied by heat, pain, and increased lachrymal secretion; also, intolerance of light. In severe cases, there are headache, nausea, constipation of the bowels, anorexia, and more or less disposition to fever. The causes of this form of

ophthalmia are mostly local—as particles of sand, dust, or insects beneath the lids, inversion of eyelashes, &c.

Treatment.—The first object should be to remove the cause. If there is an irritating substance beneath the lid, the eye should be thoroughly bathed in cold water while the lid is held open. If the substance be not removed in this manner, a vial cork should be rubbed perfectly smooth with a dry flannel: the particle may then be removed by touching it lightly with the cork. Particles of iron or steel may be removed in this manner; also by means of a small magnet. When the eye is thus relieved, it may be packed in cold water, and the patient's bowels moved by a dose of anti-bilious physic. If the injury be sufficient to cause inflammation of the eye, a mild diet may be adopted for a few days, and the packs changed as often as necessary to keep them cool.

CATARRHAL OPHTHALMIA.

Symptoms.—After exposure to cold, the eyes are noticed to have a smarting or burning sensation, and the capillaries to be sufficiently dilated to admit of the red corpuscles, whereas in a normal condition they only convey liquor sanguinis. The dilated capillaries at first exhibit a radiated appearance, but soon become confluent, and the entire conjunctiva assumes a red and highly inflamed aspect. This condition of the eye is accompanied by chilliness, aching of the bones, and some degree of fever. There is also intolerance to light, and, when the disease has become established, a puriform discharge from the eyes.

Treatment.—As this form of inflammation of the eye is dependent upon exposure to cold,—in other words, upon a contracted state of the superficial capillaries, and consequent congestion or inflammation of the deep capillaries,—the first indication of treatment is to relax the vessels of the surface, and thus unload the congested internal vessels. To effect this, the surface should be thoroughly bathed in warm lye water, the patient placed in bed, and the following emetic given:—Take lobelia seed, pulverized, twenty grains; ginger tea, one pint. Add the lobelia to the ginger tea while warm, and give one wine-glassful every fifteen minutes, until a thorough emetic effect is produced. The bowels should be opened by the liberal use of antibilious physic. During the action of the emetic

and cathartic, the eyes should be kept packed in cold, soft water. If the disease have assumed a chronic form, the pack should be applied as warm as the patient will bear it, and an astringent wash used once or twice a day, such as one grain of nitrate of silver added to one ounce of pure soft water, and a small quantity applied to the eye by means of a camel's hair pencil once or twice a day; or the eye may be bathed in a strong solution of hydrastin every morning and evening. All irritating salves and eye-washes should be carefully avoided, as they always prove injurious. If there should be fever, it may be controlled by the use of aconite. The diet should be cool and bland, the eye excluded from light, and the patient kept quiet.

INFLAMMATION OF THE EYES OF INFANTS, OR PURULENT OPHTHALMIA.

Symptoms.—The symptoms of purulent ophthalmia of children, are somewhat similar to those of catarrhal ophthalmia of adults. The eyes are kept constantly closed, the lids are red and swollen, and glued together by thick, puriform matter becoming dry. The skin will be dry, and the bowels irregular. If this disease be neglected, it will result in ulceration of the cornea and loss of the organ. The cause of this disease is exposure to cold, damp clothing, and injuries in washing the child; also the introduction of acrid matter into the eye, and a scrofulous constitution.

Treatment.—In the treatment of this affection, the eyes should be thoroughly bathed in a cold, weak solution of hydrastin, four or five times a day. They should be kept packed in cold, soft water, to which is added a small amount of the tincture of lobelia. The bowels should be kept open by the use of neutralizing mixture and leptandrin, and from one-half to one drop of aconite, given every four or five hours. Where the eyelids become granulated, they should be inverted, and lightly touched with a camel's hair pencil, moistened with a solution of vegetable caustic, once or twice a day; but much care should be taken that the caustic be all removed before the lids are closed. All poultices should be avoided. Where the disease is of a scrofulous character, either in children or adults, muriated tincture of iron, compound syrup of stillingia, hydrastin,

scrophularia, quinine, iodide of potassium, iodide of iron, and a generous diet, in connection with cod liver oil, are the remedies.

AMAUROSIS.

The term amaurosis is used to denote a partial or total loss of vision, affecting one or both eyes. The causes of this affection are various. It may arise from inflammation of the sclerotic coat, or retina, congestion of the vessels of the retina, or of the brain, effusion into the base of the brain, the too free use of ardent spirits, gastro-intestinal irritation, tuberculous affection of the optic nerve, spermatorrhœa, internal use of mercury, exposure of the eye to too strong light, &c.

Symptoms.—The symptoms of amaurosis very much depend upon the cause. Yet the following may be enumerated as generally present in cases of this kind. Imperfect vision, pain in the eye, flashes of light, dark spots appearing before the eyes, and in some cases the pupil will be obviously dilated. The disease is mostly insidious, and its progress very slow, although in some cases it is rapid, destroying the vision almost at once.

Treatment.—If amaurosis be dependent upon any of the inflammatory affections, a thorough purgative should be given at once. Take podophyllin, three grains; jalapin, one grain; cream of tartar, thirty grains: mix, divide into eight powders, and take one every hour until it operates. After which the patient should be put upon full doses of tinct. of veratrum, the pulse maintained at about fifty-five or sixty beats per minute, and the following diuretic or alterative given: Take syrup of marshmallow, half a pint; iodide of potassium, two ounces: mix. Dose, one teaspoonful three or four times a day. The eye should be kept constantly packed with cloths from cold water, the diet low, and the patient avoid all exposure of the eyes to the light, and all mental and physical labor. If effusion of lymph has taken place within the tunics of the optic nerve, or any part of the eye, causing amaurosis, absorption can be produced by the following pill: Take xanthoxylin, twenty grains; irisin, ten grains; podophyllin, three grains; iodide of potassium, thirty grains; extract of dandelion, in quantity sufficient to make a pill mass. Make three-grain pills, and let three to six be taken per day. At the same time, the kid-

neys should be stimulated by the use of cream of tartar water, and vegetable diuretics, as queen of the meadow, &c. Where there is loss of power in the nerve, bathing the forehead in strong tinct. of capsicum, three or four times a day, will be very beneficial. The eyes should be well protected from strong light, and from three to five drops of tincture of rhus radicans given three times a day. If this remedy should fail to give relief in the course of a few weeks, the following mixture should be given: Take hydrocyanic acid, eight drops; quinine sulph., twenty grains; aqua pura, three ounces: mix. Dose, one teaspoonful four or five times a day. The bowels should be kept open by the occasional use of a stimulating purgative. Cold baths should be taken as often as every third day. Where the disease is of long standing, indicating paralysis of the optic nerve, the following may be used to advantage: Take extract of macrotis, twenty grains; mux vomica, ten grains; euonymin, thirty grains. Mix, and form a pill mass, and make two-grain pills. Dose, from one to three pills, three times a day. During the entire course of treatment, the anterior portion of the head should be frequently bathed with a stimulating preparation. A gentle current of galvanism may also be passed through the eye, and from one to five drops of the tincture of phosphorus, administered four or five times a day in a teaspoonful of cod liver oil.

INFLAMMATION OF THE EYE GENERALLY.

The eye is a delicate and complex organ, composed of many different structures, and when diseased, each part requires to be considered separately. It is first necessary to distinguish between inflammation of the conjunctiva (improperly called *ophthalmia*) and inflammation of the eye-ball. The former may be caused by various disorders of the system; by the influence of the atmosphere, and by irritating applications. It may result in opacity of the cornea, but may be much relieved by local astringents. Its symptoms are extreme sensitiveness to bright lights, a burning or smarting pain, &c.

In inflammation of the eye-balls, the symptoms are a change in the color of the iris; dimness of sight; the diminished power of the pupil, which is irregular; a neuralgic pain; and great intolerance of light. When the disease becomes chronic, the trans-

parency of the cornea is lost, the vitreous humor takes a fluid form, the lens and its capsule become opaque, and paralysis of the iris occurs.

In acute inflammation, the eye-lids swell, scalding tears fill the eyes, the cornea becomes somewhat opaque, and the affection ends in suppuration.

Causes.—Inflammation of the eye-ball may be either *traumatic*, or idiopathic. The first is caused by wounds, blows, and many other injuries. Persons who are intemperate, render themselves more liable to it. The symptoms are those which have already been mentioned, added to which may be headache, fever, &c.

Injuries.—In injuries of the eye-lids and eye-brows, sutures, if introduced, should be very small, while care should be taken that the healing is in no way so irregular as to occasion distortion. Wounds of the forehead are sometimes followed by a loss of vision, which is probably the result of the shock given to the retina. Blows on the eye usually cause an unpleasant discoloration of the skin; and the slightest stroke on the eye-ball may cause a permanent injury to the eye, and even entire loss of sight. When blood is dispersed into the chambers, it may be absorbed in a short time, if the inflammation be controlled. The eye may be *ruptured* by any very severe blow. The greatest care is requisite in order to retain the sight, even although the contents may be only partially lost.

Dislocation of the crystalline lens may also occur as the result of injuries. If it be driven into the anterior chamber of the eye, and does not prove irritating, it may be left for nature to repair the injury. If it be liable to produce a permanent injury to the eye, it may be removed by extraction. This is almost always required when it lodges in the posterior chamber.

Foreign Bodies in the Eye.—Foreign bodies should be sought for by inverting the eye-lids, and having the patient turn the eye in different directions. If the foreign body be found to adhere to the mucous membrane of the cornea or conjunctiva, it can usually be removed by wrapping a silk handkerchief around a silver probe, and wiping it out. Or if it be a piece of steel, it may be removed by rubbing the end of a small cork on a piece of flannel, and ap-

plying it to the substance. On removing the cork, the foreign substance will be found adhering to it. A magnet has been used for the same purpose. If lime or mortar should get into the eye, it should be removed, and the eye washed or syringed with a weak solution of vinegar and water. If the eye should become inflamed, bathe it frequently in warm water, and use an ointment of equal parts of castor oil and laudanum. If a foreign substance should enter the anterior chamber of the eye, it should be removed, whenever it can be done, without evacuating the aqueous humor.

Prolapsus of the Iris.—Prolapsus of the iris may occur as the result of penetrating wounds of the cornea. A reduction of it may be attempted by rubbing the eyelids against the cornea so as to press on the prolapsed portion; and then exposing the eye to a strong light. If this is done immediately after the injury, it may prove successful.

DISEASES OF THE EYE-LIDS.

Hordeolum, or Stye.—Stye is a small painful pustule on the margin of the eye-lid, having its origin in ciliary follicles. It can usually be cured by applying aquæ ammonia by means of a small steel needle, puncturing the tumor slightly. If this does not remove the inflammation, it may be poulticed with slippery elm moistened in equal parts of water and tincture of lobelia.

Ophthalmia Tarsi is an inflammation of the palpebral mucous membrane with a disordered condition of the Meibomian glands.

Symptoms.—The eye-lids are stuck together by a dry mucus during sleep. If there be itching, burning, and pain, the disease is usually acute, as these symptoms do not generally occur in the chronic form. It may lead to ulceration of the hair follicles and loss of the lashes, and sometimes to thickening and inversion of the eye-lids.

Treatment.—In the treatment of this disease, the first thing to be attended to is the constitution; and it is almost always connected with a scrofulous or tuberculous diathesis. This condition should be corrected by baths, fresh air, nutritious diet, alnuin, frazerin, iron, cod liver oil, &c., and the following ointment used as a

local application:—Take muriate of hydrastin, ten grains; adeps, one dram. Mix, and form an ointment. Let it be applied by means of a camel's hair pencil, four or five times a day.

The eyes should be frequently bathed in a warm decoction of hydrastis, and if the lids are granulated, they may be touched once or twice a week with nitrate of silver.

Syphilitic Ulcers of the Eye-Lid.—If syphilitic ulcers of the eye-lids occur, they may be distinguished from other ulcers by their rapid progress, by the patient being otherwise healthy, and by their copper-colored appearance. They yield to the treatment for secondary syphilis. *Trichiasis* signifies the growing inward of the eye-lashes. It seems to depend on the thickening of the fibro-cellular tissue of the eye-lids. For the cure of this disease, Dr. Walton recommends an excision of a portion of the lid so as to give it an outward turn. The practice of extracting the lashes has also been resorted to with some success.

Entropion implies inversion of the eye-lids, to cure which an incision may be made along the edge of the tarsus, extending from one angle of the lid to the other. A second incision parallel with it should be made about four or five lines from it, and joining it at its extremities. The elliptical piece should be elevated at the end by forceps, and dissected out, down to the cartilage. The wound should be closed by sutures, and cold water dressings applied.

Lagophthalmos signifies inability to close the palpebræ.

Ptosis signifies a falling of the upper eyelid with inability to raise it. Both of these affections are usually produced by palsy, and are precursors of apoplexy, great debility, and extensive disorder of the nervous system.

Treatment.—If they occur suddenly, the bowels should be opened by an active cathartic, such as jalapin and antibilious physic, after which the following compound should be given:—Take strychnin, one grain; ferri hypophosphite, one-half dram; sulphate quinine, ten grains. Mix. Make fifteen powders; dose, one every two hours.

After these powders, tonics, chalybeates, mild aperients, and frequent baths will usually complete the cure. If the disease should prove obstinate, the powders may be repeated, and electricity applied.

Ancyloblepharon, union of the edges of the lids, cured by incision.

Symblepharon, a union of the lid to the globe, cured by dissecting the lid from the globe.

Tumors of the Eyelids may be of many varieties, such as warts, enlarged cutaneous follicles, cysts, hydatids, etc. They may be removed by extraction.

Exophthalmia signifies a dryness of the eyes from a deficiency of tears, cured by glycerine and mild tincture of capsicum.

Epiphora signifies a redundancy of tears. It usually depends upon foreign substances in the eyes, or upon a scrofulous or hysterical constitution, cured by removing the cause.

Closure of the Puncto-Lachrymalia, when caused by inflammation, is of short duration. If permanent, it may be remedied by slitting up the canal to the mucous surface.

Fistula Lachrymalis signifies a fistulous opening at the inner corner of the eye communicating with the lachrymal sac.

Treatment.—The treatment should consist in first subduing the inflammation by local and constitutional remedies, and then introducing the stylet by puncturing the internal portion of the sac a little below the punctum.

DISEASES OF THE CORNEA.

In *Acute Inflammation of the Cornea*, (acute corneitis,) resulting from neglected injury, the part becomes red and opaque, with ulceration or suppuration between the layers, or abscess of the anterior chamber.

In *Scrofulous Corneitis*, the cornea is red, opaque, and very prominent, with the redness extending to the sclerotic. The retina and iris have also a tendency to inflammation.

Opacity of the cornea is of two kinds:—1st. That resulting from adhesive inflammation, and that produced by inflammation, resulting from the effusion of fibrin between its layers, and from the effects of scrofulous ulcers, which is generally curable. This is called *nebula*, when of a slight character; but, when more dense, *albugo*. 2d. *Leucoma*, which is a dense opacity, resulting from a cicatrix of the cornea. It may be partially removed if of recent origin, but is irremediable if of long standing, and may become the seat of calcareous degeneration, requiring removal because of irritation to the eye-lids. Some cases of opacity seem to be very near the surface

of the cornea, perhaps upon the anterior elastic lamina. Those thus found are often very opaque, and are sometimes considered more serious than they really are. A lens, or the point of a needle, will usually reveal their true character.

Onyx signifies a suppuration between the layers of the cornea, resulting from acute ophthalmia. It is thus named from the resemblance it bears to the white spot at the root of the finger-nail.

Treatment.—Acute corneitis should be treated with podophyllin, jalapin, veratrin, blisters behind the ear and nape of the neck, low diet, and cold packs to the eye. The chronic form should be treated with iron, quinine, cod liver oil, and tonics. *Opacity of the cornea* may be removed, by giving menispermin, irisin, muriate of ammonia, and a weak decoction of capsicum, applied to the cornea by means of a camel's hair pencil.

Onyx usually disappears by giving small doses of podophyllin and diaphoretic powders.

Ulcers of the cornea can be cured by giving the patient tonics, and touching the ulcer two or three times a day with hydrastin, moistened with glycerine by means of a camel's hair brush.

Conical cornea is characterized by the peculiar brilliant and rounded appearance of the cornea. It sometimes can be cured by tonics, and improving the general health of the patient.

Iritis.—Inflammation of the iris generally involves the sclerotic. It may be diagnosed by the iris changing its color, by intolerance of light, dimness of vision, and a burning and stinging pain in the eye.

Treatment.—Cold packs should be applied to the eye, and frequently changed. Small blisters should be placed behind the ears, and the patient given one-eighth of a grain of podophyllin, and one-half of a grain of quinine every two hours, until it acts freely upon the bowels. If there be deposition of lymph, it should be absorbed by giving small doses of menispermin, apocynin, iodide of potassium, and ammonia.

CATARACT.

Cataract consists of an opacity of the crystalline lens, or of its capsule, or it may include the capsules and lens. It may be complete or incomplete; hard or soft.

Symptoms.—Before examining any patient with suspected cata ract, the pupil should be dilated with belladonna, and then, if there be capsular cataract, there will be seen behind the pupil an opaque body, of a gray dead-white; if lenticular cataract, of a bluish-white, or amber color. The patient usually gives, as his history, that his vision has become greatly impaired—that objects appear of irregular outline, or multiplied, or as if surrounded with a mist, or as if a cloud were interposed between him and the eye. If lenticular cataract alone be present, he will say that the sight is better in the evening, or in a subdued light, or when the back is turned to the window, or after the application of belladonna—obviously because the pupil, being dilated under these circumstances, permits more light to pass through that part of the lens which is as yet transparent, or which, though opaque, is thinner, and therefore affords less obstruction to light than the centre. In the most confirmed cases, the patient is yet able to distinguish day from night.

There is also the *catoptric test*—that is, the mode of examining the eye by the reflection of light, which was proposed by Mr. Sansom. When a lighted taper is moved before the eye of a healthy person, three images of it may be observed—1st. An erect image, that moves upwards when the candle is moved upwards, and that is produced by reflection from the surface of the cornea. 2d. Another erect image, produced by reflection from the anterior surface of the crystalline lens, which also moves upwards when the candle is moved upwards. 3d. A very small inverted image, that is reflected from the posterior surface of the crystalline lens, and that moves downwards when the candle is raised upwards. To render this more distinct, the pupil should be dilated, and the examination be made in a dark room. Now, in lenticular cataract, the inverted image is, from the first, rendered indistinct, and soon abolished, and the deep erect one is soon afterwards abolished also. In capsular cataract, from the first, only the front erect image, that, namely, produced by reflection from the cornea, is visible.

Causes.—Cataract, especially capsular, is sometimes attributed to inflammation, and may be caused in a short space of time by wounds, or other injuries of the lens and capsule, or of the eye in general. But the ordinary cataract of the old seems to be a mere effect of impaired nutrition.

Hard Cataract.—This form is met with in elderly people only. It is caused, according to Mr. Walton, by grayness or opacity appearing in an already discolored lens, and the greater the coloration of the lens, the less will be the amount of grayness required to obstruct vision. After thirty, the lens naturally acquires a yellow color, and the hue becomes deeper, till it is like a piece of amber. The amber color, therefore, the characteristic hue of cataract in aged persons, is not the effect of disease. Sometimes the color is as deep as that of dark mahogany, and Mr. Walton has brought before the Royal Medical and Chirurgical Society the particulars of a case in which the cataract was so black that it could not be detected till the eye was examined with the ophthalmoscope, or the concentrated light of a powerful lens.

The opacity generally commences in the superficial layers of the lens, for the most part in the form of streaks or radii, converging towards the centre, or, more correctly speaking, following the course of the natural divisions of lens. Less frequently it commences in the nucleus in the form of a cloudy opacity. When the disease is of long standing, the surface of the cataract frequently assumes a uniformly milk or cream-white color.

Soft Cataract.—While hard cataract is seen only in persons above thirty-five years of age, the soft may occur at any period of life. It appears to be due to disintegration affecting the whole substance of the lens, similar to that which affects the surface alone in hard cataract. The color in infancy is bluish-white, like milk and water. Later in life, there is generally less of the blue tint. The surface frequently presents an appearance like that of fractured spermaceti, or it may be traversed by radii and streaks, which glisten like a piece of tendon. In this variety, vision is generally more imperfect than in the hard kind. The iris is frequently pressed upon by soft cataract, but this may also occur in hard cataract, when the superficies are much degenerated. This phenomenon is probably due, in the majority of instances, to the swelling of the diseased lens from the imbibition of moisture, but, in other instances, the opinion of Mr. Walton is doubtless correct, that it is caused by unnatural vascularity in the deep-seated texture of the eye-ball.

Congenital Cataract must, therefore, always be soft. In this variety, vision is generally more imperfect than in the hard kind.

Capsular Cataract.—In this variety the opacity may be general, or may commence partially. It is almost invariably of a dead or chalky whiteness, scarcely ever shining, and always showing the same opacity in whatever position it may be viewed. It is not unfrequently the result of a slow inflammation, which may be accompanied with pain in the eye. It may be produced, also, by inflammation extending from the iris. Opacity of the *anterior* portion may be seen immediately behind the iris. That of the *posterior*, appears at some little distance behind the pupil, and presents a concave striated surface, of a dull-yellowish appearance.

Capsulo-Lenticular cataract is very common—in fact, entire opacity of the capsule is always followed by opacity of the lens.

Medical Treatment.—It is but recently that medical treatment has been considered of any avail in cases of cataract; but recent observations have demonstrated that by a well directed course of medication, incipient opacity of the lens may be removed, and, in many other instances, the progress of the disease arrested. The remedies that have been most successful are, podophyllin, irisin, xanthoxylin, muriate of ammonia, iodide of ammonia, and iodide of potassium. A case of soft cataract in a lady sixty years of age, was cured by the following compound:—Take podophyllin, ten grains; menispermin, one dram; xanthoxylin, one-half dram; iodide of ammonia, two drams; simple syrup, four ounces. Dose, a teaspoonful four or five times a day, and continued until slight ptyalism was produced. The medicine was then omitted, and cod liver oil and hypophosphate of iron, given for a week or ten days, when this was omitted, and the first prescription taken for several weeks. This course removed the disease in about six months. Other cases have been cured by a similar treatment. When remedies fail, recourse should be had to a surgical operation.

DISEASES OF THE EAR.

Foreign Substances in the Ear.—Children frequently put peas, beans, kernels of corn, bits of glass, &c., into the ear, which,

if allowed to remain, will produce active inflammation. Hence, they should be removed as soon as possible. It may be done by syringing the ear with warm water or by means of forceps.

Accumulation of Wax in the Ear.—Wax frequently accumulates in the ear to such an extent as to obstruct the hearing. It should be removed by frequently syringing the ear with warm water. If it is not removed by the first syringing, it should be repeated, and the ear kept packed in the intervals with pads wet in warm water.

Polypus.—Fleshy pedunculated growths sometimes occur in the ear. They generally spring from the glandular portion of the meatus. They should be clipped off at the point of attachment, with a pair of fine pointed scissors, and the wound touched with a weak solution of sulphate of zinc.

Fungous Granulations of the Ear.—These should be removed by syringing with a solution of nitrate of silver of the strength of three grains of the silver to one ounce of water. Afterwards apply lint to the ear, moistened with the following ointment: Take glycerine, one ounce; sanguinarin, ten grains. Mix; wet small pledgets of lint with it, and apply to the ear twice a day.

Neuralgia of the Ear, or Otalgia signifies violent pain in the ear, and is caused by local inflammation and carious teeth, together with the general causes of neuralgia.

Treatment.—If caused by inflammation, a warm poultice of slippery elm, moistened in tincture of opium, should be applied, and repeated as often as it gets cold. If produced by carious teeth, the tooth should be removed. If it is a general neuralgic affection, it should be treated as indicated under the head of neuralgia.

Deafness.—Deafness may be caused by a closure of the eustachian tubes, by enlarged tonsils, by anæsthesia of the auditory nerve, and by inflammation and ulceration of the tympanum. It may depend upon organic lesion of the brain.

Treatment.—When it depends upon enlargement of the tonsils,

compound syrup of stillingia, and iodide of potassium should be given internally, and the throat frequently gargled with a decoction of equal parts of hydrastis, capsicum and bayberry. Where it depends upon anæsthesia of the nerve, the following compound may be given: Take prussiate of iron, one ounce; Keith's strychnin, one grain; quinine, ten grains: mix, and make twenty powders. Dose, one every four hours.

The parts around the ear should be bathed three or four times a day, in a strong decoction of capsicum, and in some cases, gentle currents of electricity may be passed through the ear to advantage.

SECTION XVII.

MALIGNANT AND VENEREAL DISEASES

CANCERS, OR MALIGNANT TUMORS.

Cancer usually presents itself in four or five varieties; each variety possessing characters peculiar to itself, viz., schirrous, or hard; encephaloid, or soft; colloid, or gelatinous; melanosis, or black cancer. (Fig. 44 shows the arrangement of fibrous cancer-cells, as they occur in the female breast. Fig. 45 shows the same, after the addition of acetic acid. Fig. 47 shows the isolated cancer-cells from the same growth. Fig. 46 shows the same, after the addition of acetic acid.)

The scirrhous variety is hard, firm, and transparent, and of a grayish color. The encephaloid is brain-like in its appearance, and is of a soft and hemorrhagic character. The colloid resembles glue, or honey in the comb. The melanotic is of a black color, and is sometimes soft, and at others hard. Another variety of cancer is mentioned by some authors, called epithelial cancer.

These various forms may exist separately, or one variety may be associated with, or take the place of another. Thus encephaloid may take the place of scirrhous, or colloid; melanosis, scirrhous, and colloid, may exist in the same tumor. The microscopic character of all these different varieties is essentially the same.

They all yield, by pressure, a turbid fluid, called cancer-juice, in which are granule cells, pigmentary and fatty matter. The cancer

cells are spherical, fusiform, and spindle-shaped, elliptical or caudate, having two or three terminations.

Mr. Bennett remarks:—"The so-called *cancer-cells* may be round, oval, caudate, spindle-shaped, oblong, square, heart-shaped, or of various indescribable forms, produced by pressure on their sides. In size they vary from the $\frac{1}{1200}$th to the $\frac{1}{400}$th of an inch in diameter. The cell-wall, when young, is smooth and distended; when old, it is more or less corrugated and flaccid. Each cell contains at least one nucleus, often two, and sometimes as many as nine.

Fig. 44.

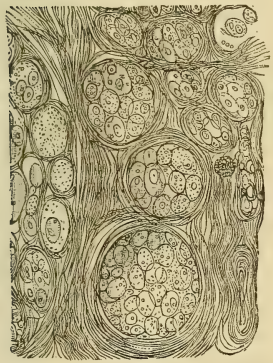


Fig. 45.

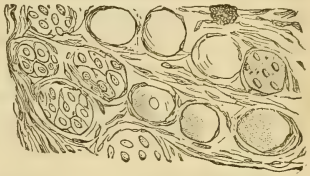


Fig. 46. Fig. 47.

Most commonly there is only one, which is round, or more generally oval, and contains one or two granules, or nucleoli. The nucleus also varies in size, and may occupy from one-sixth to four-fifths of the volume of the cell. Between the nucleus and the cell-wall there is a colorless fluid, which, at first transparent, becomes afterwards opalescent, from the presence of molecules and granules. On the addition of water, the cell becomes distended by endosmose, and is enlarged. When acetic acid is added, the cell-wall is rendered more transparent, and in young cells is entirely dissolved, whilst the nucleus, on the other hand, either remains unaffected, or its margin becomes thicker, and its substance more or less contracted."

The crasis, or condition of the blood which exists in cancer, consists in the preponderance of albumen, and an excess of fat; and it is evident that the development of cancer is owing to perverted nutrition, that the healthy blastema, as it escapes from the capillaries, by some local influence, instead of forming healthy tissue, contributes to the development of this unhealthy product.

The cause of this perverted cell-growth is doubtless the result of an injury inflicted upon the part where the future cancer makes its appearance. This injury may be mild, pressure producing a deformity of the healthy cell, which deformity is transmitted to the nucleus, and to all the cells that are developed from it. Thus, a series of irregular cell developments result in that heterologous tissue known as cancer. The injury inflicted may be violent, producing speedy, irregular cell development, or it may be gradual, and the cell-growth only approximating to that abnormal structure which by degrees assumes a real malignant character. All the facts yet observed relative to the nature and history of this disease warrant this explanation; as all cases of primary cancer occur on such organs as are liable to such injuries, besides, in a large majority of cases, the cancer development may be traced directly to this cause.

Also, the unsuccessful treatment of cancers by the use of the knife, and the successful treatment, by a long-continued course of sloughing and caustic applications, most conclusively proves that, as long as one single, irregular, or nucleated cancer cell remains, so long will the cancer development continue.

Secondary cancers may be developed by the absorption of these cells, and their transmission through the lymphatics and blood vessels, to the organs and tissues, far from the primitive development. Thus, cancer of the lungs, &c., may be developed from cancer cells, formed in the breast or face. Next to the female breast and uterus, the cancers most common, are first, the face; second, the stomach; third, large intestines; fourth, retro-peritoneal cancer in front of the spinal column; fifth, hepatic; sixth, bone cancer; seventh, cancer of the skin and lips; eighth, brain; ninth, globe of the eye; tenth, testes; eleventh, ovaries; twelfth, kidneys; thirteenth, tongue; fourteenth, œsophagus; fifteenth, salivary glands and parotids.

Symptoms.—A small hard tumor most frequently in the breast

is the first indication of *scirrhous* cancer. It is at first movable and unattached to the integument, but eventually forms deep and superficial attachments. It grows slowly—is irregular in shape, and painful. The pain is mostly sharp, lancinating, and is much increased on pressure. In the course of time the tumor absorbs the tissue beneath the skin, and becomes attached to it, which presents a bluish nodulated appearance. Ulceration usually takes place by the skin becoming absorbed. As the sloughing proceeds, the edges become ragged and everted, having a bluish purple color. The ulcer discharges a fetid sanious pus.

Encephaloid or soft cancer is more frequently met with in the globe of the eye, testes, nares, &c. It commences as a soft, elastic, lobulated tumor, having a semi-fluctuating feel. The skin covering it is loose, and covered with large dilated veins. It attaches itself to the integument, and ulceration occurs.

In some cases a mass of fungous flesh called fungus hæmatodes is thrown up from the tumor, which bleeds profusely. The lymphatic system soon becomes involved, and general constitutional disturbance is always an early symptom in this form of cancer.

Colloid or *gelatinous* cancer usually occurs in the internal viscera, although it occasionally occurs in the superficial tissues. It consists of cysts filled with a gelatinous semi-transparent fluid. *Melanosis* or *black* cancer occurs in the form of dark pigmentary matter, mostly upon the serous membranes. When ulceration occurs, a dark sanious matter is discharged.

Treatment.—The treatment of cancer is both constitutional and local. In the incipient stage it consists in a radical extirpation of the diseased mass, either with the knife or caustics, and the sloughing process. For the purpose of removing the tumor, apply an ointment made as follows: Take the expressed juice of fresh pokeweed or phytolacca decandra, rumex crispus or yellow dock, and blood root or sanguinaria canadensis, equal parts. Evaporate the juice by means of a sand bath to the consistency of tar. Remove the cuticle over the tumor by means of blister plaster, and apply the ointment, renewing the application two or three times a day, washing the part each time with the best French brandy. This should be continued until the eschar involves the entire tumor, when a poultice should be applied, made in the following manner:

Take pulverized indigo weed, or baptisia tinctoria, Peruvian bark, and slippery elm, equal parts, moisten with brewer's yeast, and apply, changing several times a day, until the dead mass is entirely sloughed out, washing with the brandy before each application. If there is appearance of any portion of the cancerous tumor remaining, renew the application of the ointment, washing with brandy, and followed by the poultice. During the local treatment, the patient should abstain from the use of fats, and animal albumen, the diet consisting mostly of nutritious vegetables, fruits, &c.

The surface should be freely bathed daily, and the patient allowed free exercise in the open air. When the cancer tumor is entirely removed, a mild sloughing of the parts should be produced by the use of the following ointment:—Take sulphate of zinc, one ounce; balsam of fir, five ounces; white wax, one ounce. Melt the wax and balsam together, and while cooling, add the zinc finely pulverized, also, add thirty drops of creasote. Apply the zinc ointment in connexion with brandy, washing in quantity and frequency sufficient to keep up a mild discharge, until every vestige of unhealthy growth disappears. In ordinary scirrhous cancer, if removed before suppuration occurs, it will usually suffice to continue the zinc ointment, for two or three weeks. In cases of open cancer, where the cancer cells may have been absorbed, and passed into the blood, in addition to the above local treatment, a thorough course of constitutional medication will be required, consisting mostly of tonics and antiseptics, tonics for the purpose of maintaining the integrity of the constitution, and antiseptics and alteratives to prevent the formation of cancer cells in other tissues, and to remove any detached cells that may be circulating in the blood. Among the best tonics are hydrastin, cerasein, chamomile, pyrophosphate of iron, &c. These may be given in alternation or combinations, and in such quantities as may be deemed expedient, to maintain the strength of the patient. The following compound will be found a valuable one for this purpose:—Take hydrastis canadensis or golden seal, English chamomile, and chimaphila umbellata, or pipsissewa, of each one ounce; pulverize, and add to one quart of good port wine. Give one wine glass full three or four times a day.

To prevent the growth of absorbed cancer cells, the following compound will be found valuable:—Take oil of tar, two ounces; hydrocyanic acid, ten drops; mix, and let the patient take from ten to fifteen drops; four or five times a day. To remove the crasial condition of the blood, the compound alterative syrup in connection with iodide of potassium, or the compound syrup of stillingia, may be used in quantity as indicated. If the caustic application recommended do not prove sufficient to remove the tumor, the following application may be used: Take sulphate of iron, one ounce; add sulphuric acid sufficient to make a paste of the consistency of cream. Surround the tumor with a plaster of white wax, and apply the paste, allowing it to remain until a deep eschar is formed. If the first application be not sufficient, repeat it two or three times a day, until the eschar involves the entire tumor. The wax plaster is applied to prevent the caustic from injuring the integuments surrounding the tumor. After the life of the tumor is sufficiently destroyed, it may be sloughed out, as recommended in the first instance.

Another application that has been very successfully used, is to take sulphurous acid and pulverized sanguinaria canadensis. Take one ounce of sanguinaria, gradually add the acid, and stir constantly until a thick paste be formed. This can be applied the same as other caustics. Another recipe is to take carbolic acid, and form an ointment by means of equal parts of beeswax and lard. Sulphate of zinc, sesqui-carbonate of potash, potassa fusa, quick lime, horse sorrel, extract of clover blossoms, arsenious acid, chromic acid, and many other caustics are used in the form of ointments, and otherwise to destroy the cancerous mass.

The object of these applications, is to remove the diseased mass in such a way as to effectually prevent the absorption of cancer cells. The reason why caustics are more successful than extirpation by the knife is, that during the operation with the knife the cancer cells are liable to be penetrated and conveyed to the surrounding tissues, and from thence to the blood, forming new cancer cell growths in other parts of the body, while the caustic destroys the cell at once, and thus absorption is prevented.

The above plan of treatment applies equally well to all varieties of the disease, although in some forms where the cancerous dis-

charge has produced much exhaustion, a more nutritious diet should be allowed.

Treatment of Cancer of the Uterus.—To treat cancer of the uterus, a large-sized glass speculum should be introduced into the vagina, and so adjusted as to entirely cover the portion of the uterus affected. Then apply with the probang a moderately strong solution of vegetable caustic, or of sulphate of zinc, allowing it to remain for several minutes, then removing it, apply a thick mucilage of slippery elm, filling the speculum. After which withdraw the speculum, and allow the elm poultice to remain in the vagina, and, if necessary, secure it by a T bandage. This application should be continued until all traces of the disease are removed. Afterwards the parts should be dressed with very mild zinc ointment, and frequently cleansed by the use of antiseptic washes. The constitutional treatment consists of tonics, iodide of ammonia, iron, Donovan's solution, Fowler's solution, and Mecca oil.

GONORRHŒA.

Gonorrhœa is a disease affecting the urethra, prepuce, and glands of the male, and the vulva and vagina of the female. It is accompanied with a discharge of muco-purulent matter. Gonorrhœa is generally considered as a specific, local, and contagious disease. That it is a specific and infectious disease, does not admit of a doubt. It is also in a great majority of cases local. Although, in many cases, gonorrhœa, when of long standing, and in scrofulous constitutions, affects the fibrous tissues, producing rheumatism, inflammation of the testicles and sclerotica, which are followed by specific symptoms; it also displays itself upon the mucous membrane of the throat and eyes, in the form of chronic inflammation and ulceration, and upon the skin by a specific eruption.

Symptoms.—In from three to five days after exposure, the male subject will feel an itching and burning sensation along the urethra, with difficult micturation.

On inspection, the mucous membrane of the urethra will appear red and swollen, and, by pressure, a small quantity of muco-purulent matter will be seen to escape. As the disease advances, the difficulty of urinating will be increased, and the discharge will be

very profuse. In some cases, the disease appears to extend to the prostate, bladder, and testicles, in which event the latter become swollen and very painful, and the difficulty of urinating is aggravated. One of the most troublesome symptoms of this disease is chordee, which consists in the painful erection of the penis at night, with a twist downwards.

In the female, the local symptoms are analogous to those of the male, save the chordee. The constitutional symptoms in both male and female consist, in the early stage, in slight febrile reaction, constipation of the bowels, headache, and derangement of all the secretory and excretory functions.

Treatment.—In the first stage of the disease, a free purge of podophyllin and cream of tartar should be given. At the same time, the parts should be thoroughly packed with cold or hot water, and mucilaginous injections frequently introduced into the urethra or vagina, as the case may be. To control the inflammatory symptoms after the purge, aconite or veratrum should be given, until the active inflammation is subdued, after which, if the disease is not subdued, specific medication should be given as follows:—Ten or fifteen drops of Mecca oil every two or three hours. At the same time, the penis or vagina should be injected three or four times a day, with the following emulsion:—Take gum Arabic, two drams; water, six ounces; sulphur and sugar of lead, thirty grains each. Mix, and use for injections three or four times a day.

The following compound has frequently been used to a good advantage:—Take balsam copaiba, one ounce; sweet spirits of nitre, two ounces; oil of cubebs, one dram; emulsion of gum Arabic, two ounces. Mix. Dose, tablespoonful three or four times a day; or, take ten drops of oil of erigeron every two or three hours, and inject with the following:—Take muriate of ammonia, one dram; sulphate of zinc, one dram; water, four ounces. Mix, and inject the penis or vagina four or five times a day. One day frequently suffices to cure a case in the early stage. Another remedy, which has proved very effectual, is to take tincture of gelseminum sempervirens one dram; acetate of potassa, two drams; aqua, six ounces. Dose, one teaspoonful four or five times a day. Hot water injections, and in the male, packing the parts in hot or cold water, proves of great value.

The following compound has been very highly extolled as a specific in gonorrhœa:—Take white wax, one dram; solidified copaiba, two drams; white pine gum, half a dram. Melt, and form a paste. While it is cooling, add oil of juniper and pulverized cubebs, of each one dram. Dose, a pill the size of a pea every two hours. Where the discharge is profuse, equal parts of hydrastin and tannin as an injection, three or four times a day, will be found of much value. Where there is chordee, small doses of camphor and gelsemin will control that symptom. During the entire treatment, the bowels should be frequently opened with mild purges of podophyllin and cream of tartar. The diet should consist entirely of vegetables, and all spirituous and stimulating drinks be carefully avoided.

In cases where gonorrhœa has become chronic, and the mucous membrane of the urethra softened or granulated, I have been in the habit of applying the following ointment by means of Lalleman's porte caustique:—Take argenti nitras, ten grains; hydrastin, one dram; adeps, four drams. Mix, form an ointment, and apply three or four times a day.

BALANITIS.

Balanitis, or gonorrhœa præputialis, consists in an inflammation of the corona glandis, and the mucous membrane of the prepuce, followed by a muco-purulent discharge. It may be produced by phymosis, the retention of the secretions from the glandulæ odoriferæ, an acrid discharge from the vagina, leucorrhœa, gonorrhœa, etc.

Treatment.—This may usually be removed by cleanliness; or in case of elongation of the prepuce, circumcision should be performed. If produced by gonorrhœa, bathing the parts in a solution of nitrate of silver, in the proportion of five grains to an ounce of water, will effect a cure.

GLEET.

Gleet consists of a transparent mucous secretion from the urethra, and is frequently the sequela of gonorrhœa. It may be produced by stricture in some portion of the urethra, or by a chronic inflammation of the urethral mucous membrane. By nervous patients it is frequently mistaken for spermatorrhœa.

Treatment.—The practitioner should introduce a bougie, and

ascertain whether there be stricture; and if it exist, small-sized bougies, thoroughly lubricated with glycerine, should be introduced, and repeated every day or two, gradually increasing the size until the stricture is overcome. At the same time, one dram of Mecca oil should be administered three times a day. This treatment has been universally successful in a large number of cases. Many other remedies, however, have been used, such as iodide of potassium and ammonia, tincture of cantharides and ergot, gelsemin, pareira brava, cannabis sativa, and astringent injections. Formerly we were in the habit of using these remedies; but, since adopting the oil and bougie treatment, we have had no occasion to do so.

SYPHILIS.

Syphilis, like gonorrhœa, is a disease which arises from sexual intercourse, and is transmitted through the medium of the secretions. It has been divided into different stages, as local or primary, secondary and tertiary.

Symptoms.—The first symptom of syphilis is the appearance of a chancre, generally, on the genital organs. It usually commences with a little pustule, with a small blister on the apex, which breaks in a few days, and leaves a red abraded surface beneath. The sore, which is at first small, gradually increases in size to a deep rigid-looking ulcer, presenting a great variety of appearances in different cases. It has also received different names, according to its appearance. Thus, it is called *simple* chancre when its edges are smooth; *indurated* or *Hunterian*, when its edges are indurated; the *phagedænic*, or *sloughing* chancre, when its edges are ragged and sloughing. There may be one chancre, or there may be a great number. They may be confined to the genital organs, or they may extend to all portions of the body, especially to the nose and throat. In the first instance, unless syphilis is hereditary, it is purely a local affection, but, if allowed to remain for any considerable length of time, the matter becomes absorbed, and secondary or constitutional symptoms appear. This is indicated by *buboes* or enlargements of the inguinal glands, which present a blue and hard appearance. A large number of copper-colored spots also appear on the surface. (See plate on skin diseases.) If the

disease be not removed, large indolent ulcers appear on different parts of the body.

In the tertiary form of the disease, the serous and osseous tissues become involved, and syphilitic rheumatism, neuralgia and tertiary ulcers of a most frightful character make their appearance. The digestive organs become impaired, the blood impoverished, and, not unfrequently, tuberculous deposits occur in various organs and tissues of the body.

Treatment.—In *primary* syphilis, but little more is necessary than effectually to destroy the chancre, and to heal the parts by means of mild dressing. To prevent secondary symptoms, much care should be taken with reference to the kind of caustics. The common practice is to use nitrate of silver. Hence, the large per cent. of secondary symptoms consecutive upon primary syphilis. Nitrate of silver forms an eschar, without entirely destroying the virus, and thus the poisonous matter is absorbed and carried through the system, causing secondary effects.

The pure stick caustic of potassa is the best for this. It should be applied sufficiently thorough to destroy every vestige of the unhealthy portion of the chancre. After which a flax-seed poultice should be applied, and allowed to remain until all portions of the destroyed tissue are sloughed out. It should then be dressed with mild zinc ointment, until it is entirely healed.

During the treatment, the patient should abstain from all fat meats, spirituous liquors, and excesses of every kind. A purge of podophyllin and cream of tartar should be given every twenty-four hours.

If the disease is absolutely in its primary stage, the above course of treatment will effect a cure in a few days.

Treatment for Constitutional or Secondary Syphilis.—The treatment for secondary syphilis is both specific and general.

The general treatment consists in regulating the bowels with mild purges, bathing the surface with alkaline baths, abstinence from stimulating food and drinks, and the observance of rest.

The specific treatment consists in the use of such remedies as exert a specific influence over the disease. The following remedies may be used to act specifically in secondary syphilis:—Phytolaccin,

irisin, iodide of potassa, scrophularia, corydalin, chimaphilin, tincture of kalmia, latifolia, or mountain laurel, citrate of iron, potassa, bromide of potassa, quinine, iron, creasote, hydrocyanic acid, menispermin, muriate of ammonia, ceanothus Americanus, &c. In the commencement of treatment, the patient should take a thorough lobelia and blood-root emetic, followed by an active purge of podophyllin, cream of tartar, and sulphur. Take podophyllin, two grains; cream of tartar, thirty grains; sulphur, twenty grains. Triturate, mix, and divide into five powders. Dose, one every two hours, until it operates as a purge. Afterwards give the patient a thorough spirit sweat, followed by an alkaline bath. When the system has been thus prepared, one or more of the specific remedies should be given. Take compound syrup of stillingia, one pint; iodide of potassa, one dram; phytolaccin, one-half dram. Triturate the iodide of potassa and phytolaccin in two ounces of glycerine, then add the syrup, and let the patient take one teaspoonful four or five times a day. After this remedy has been used for one or two weeks, it may be omitted, and the following may be used in its place:—Take quinine, thirty grains; citrate of iron, twenty-five grains. Mix, divide into ten powders, and let one be taken three times a day, in connection with five or ten drops of the tincture of kalmia. These remedies may be followed by corydalin, chimaphilin, and citrate of iron.

If there be fine mercurial erythema, as is often the case in syphilis after the old school treatment, the scrophularin will remove it. If there are chancres, or syphilitic ulcers, they should be cauterized with nitric acid, and dressed with mild zinc ointment and elm poultices. During the treatment the patient should retire from business, and observe perfect rest. The diet should be mostly vegetable and cooling. When the prominent symptoms have disappeared, a more liberal diet may be allowed. The surface should be frequently sponged, and the bowels kept open.

In the tertiary form of syphilis, the treatment does not differ essentially from the above, except that the diet should be more nutritious, and the medication less active.

Where buboes appear, they may be dressed with the following:—Take tincture of iodine, two ounces; tincture of arnica, one dram; tincture of scrophularia, three drams. Mix, and apply by wetting

pads of linen, which may be secured by means of adhesive strips. If this does not discuss them, they should be caused to suppurate by means of warm elm poultices, and healed by means of mild zinc ointment. Where the bones have become affected, in addition to the above remedy, phosphate of lime should be frequently used, in connection with quinine. Where the patient has been maltreated with mercury, &c., diluted sulphuric and nitro-muriatic acid will be found valuable, in connection with compound syrup of stillingia.

I have cured several cases of the tertiary form of syphilis, that had been mercurialized until it was difficult to decide whether mercurial or syphilitic affection was most prominent, with the following:—Take nitro-muriatic acid, one dram; water, six ounces. Mix. Dose, forty drops, in one teaspoonful of compound syrup of stillingia, three times a day. Where the tertiary form of the disease is connected with neuralgia and rheumatism, the following mixture will be found valuable:—Take lupulin, one dram; quinine, twenty grains; ferri hypo-phosphite, one dram; hydrocyanic acid, twenty drops; syrupus simplex, six ounces. Dose, a teaspoonful every two or three hours.

The strength of the patient should be well supported. Fresh air and cheerful company will also facilitate a cure. Prof. McClintock is in the habit of using blue mass, podophyllin, and neutralizing mixture, in such a manner as to have the patient receive one-fourth of a grain of podophyllin, one-eighth of blue mass, and one teaspoonful of neutralizing mixture, four or five times a day; and in the most obstinate form, he administers from one-sixteenth to one-twentieth of a grain of corrosive sublimate. In my own practice, I have been in the habit of relying upon sulphuric acid, iodide of ammonia, sulphite of soda, phosphorous, phytolaccin, quinine, and cod-liver oil. In some extreme syphilitic cases of the tertiary form, I have administered five or ten drops of Donovan's solution, in a teaspoonful of cod-liver oil, with apparent benefit. When there is syphilitic ulceration of the fauces, they should be touched once or twice a day with a moderately strong solution of argenti nitras. In addition to the constitutional treatment, I have uniformly experienced great benefit from the use of the vapor sulphur bath, once or twice a week. The diet should be generous, and consist of a mixture of animal and vegetable food. Alcoholic stimulants should be prohibited, unless in case of great debility.

SPERMATORRHŒA.

By spermatorrhœa is understood involuntary loss of semen. The most frequent cause of this difficulty is self-abuse; although it may be produced by every thing that tends to excite the urino-genital organs; hence, it may be induced by constipation, ascaris in the rectum, hemorrhoids, stricture of the urethra, excessive venery, frequent use of mercurials, and the habitual use of spirituous liquors.

Symptoms.—If spermatorrhœa be associated with any considerable loss of semen, it is followed by nervous debility and irritability; constipation; dyspepsia; disturbed sleep; despondency; hypochondria; epilepsy; mental inertia; and insanity.

Treatment.—There are but few diseases where so much quackery has been resorted to as in the management of this affection. Unprincipled physicians are in the habit of extorting large sums of money from patients of this class under false pretences. The treatment consists in removing the cause; hence, if produced by masturbation, the patient should be informed of the fact, and the practice prohibited. The bowels should be regulated, and if parasites infect the rectum, they should be removed. The stomach should be kept in a healthy condition, and frequent baths and lively company enjoined. In addition to the general bathing, the genital organs should be showered in cold water once or twice a day. The specific remedies that have proved of the greatest value in this disease, are gelsemin, camphor, lupulin, strychnin, viburnin, ergot, cantharides, and phosphorus. These may be used either separately, or in such combinations as the circumstances require. The topical applications consist in cauterizing the urethra by means of Lallemand's porte caustique; and the introduction of bougies, lubricated with an ointment of hydrastin. Quinine, iron, and general tonics also have a favorable influence on this disease.

MASTURBATION.

It can hardly be denied that there are few habits that are more prevalent or pernicious in their effects than masturbation. There is scarcely a practitioner of any considerable experience and observation, who has not observed the frequency in which it led to sper-

matorrhœa and nymphomania, with all their terrible consequences. From the silence which has been observed by medical writers and teachers relative to these diseases, and the extensive practice of it at this period, we infer that either the subject has been grossly neglected, or that masturbation is alarmingly on the increase. The practice of self-pollution, when at first resorted to, has but slight impression upon the constitution; but, if continued for a few months, or years, at last, it produces not only an abnormal condition of the sexual organs, which results in nymphomania or spermatorrhœa, but affects the nutritious functions, and lays the foundation for scrofula, phthisis, and insanity, besides so enfeebling the general forces of the body as to predispose the sufferer to many other maladies.

Symptoms.—The symptoms of masturbation are, physical and intellectual debility, irritable and vacillating disposition, dyspepsia, constipation of the bowels, dry and husky skin, scanty and high-colored urine, cold hands and feet, and an irregular and capricious appetite. If the male abandons the practice in this condition of the system, it will soon be followed by involuntary discharges of semen. At first this will occur at night during lascivious dreams, but in time they will occur during defecation and micturition. In this event there will be atrophy of the testicles, cold and shrivelled condition of the penis, together with impotency. Or if the impotency is not complete, the erections of the penis will be feeble, and almost immediately followed by emissions. In the female, where the practice is abandoned, there will be an irritability of the nervous system, a tendency to irregularity of the menses, leucorrhœa, prolapsus uteri, and, in many cases, frequent ovarian excitement and discharge of the ovule. If the disease be protracted, the parts become weak, relaxed and cold, and the patient averse to sexual intercourse.

NYMPHOMANIA.

Nymphomania is a disease of females, consisting of an irresistible desire for sexual intercourse. It more frequently occurs in those of a nervous, irritable habit; or of a dark, scrofulous, or tuberculous constitution. It is produced by masturbation; the reading of lascivious books; high, stimulating living; an absence of

physical and mental employment; parties; gay company; uterine and vaginal irritation; hemorrhoids, and the presence of parasites in the rectum. In the majority of cases, this condition is never made manifest by the patient; but in others, the feelings of modesty are overcome, and she gives vent to the most obscene expressions, and immodest and disgusting manifestations. It may amount to absolute insanity, or only an irritable and passionate condition of the mind; while in other cases, the patient seeks to satiate her morbid passion by sexual commerce, or self-abuse. It soon, however, undermines the constitution, producing an irritable condition of the bowels and digestive organs, disorganization of the blood, tuberculous degeneration, hæmoptysis, deranged menstrual functions, leucorrhœa, lumbago, constipation, melancholy, pulmonary consumption, and death.

Treatment.—The treatment consists in removing the cause, invigorating and toning the stomach and bowels, hot sitz baths, cold vaginal injections, and the cauterizing of the clitoris with argenti nitras, in cases where the disease has been produced by masturbation. Senecin and gelsemin, in the proportion of two grains of the former to one-tenth of a grain of the latter, two or three times a day, exerts a specific influence over the disease, and I have cured many bad cases with it. Quinine, iron, and cypripedin, also exert a favorable impression.

SATYRIASIS.

Satyriasis is an insatiable desire for sexual intercourse. This is a species of nervous disease produced by a disordered condition of the cerebellum, caused by alcoholic drinks, high living, excessive venery, and a large development of the base of the brain. It can be cured by a low diet, frequent shower baths, physical out-door labor, ice-bags to the cerebellum, a hard bed, and hop pillows.

SECTION XVIII.

ANTIDOTES TO POISONS.

The term antidote had formerly a much wider signification, and was applied to the remedies for diseases occurring from natural causes, as well as those for the derangement of the functions, arising from the direct introduction into the system of a known and material poison.

The selection of appropriate means to counteract the effects of poison must be determined by a knowledge of the manner in which a particular poison acts; but as our limits will not permit us to enumerate or specify these, some general rules, only, will be given.

The first indication is to remove the poisonous substance; the second, is to prevent or limit its local effects; the third, to obviate the effects on remote organs, supporting their action by appropriate measures, till the injurious impression has subsided. The first of these is to be accomplished mostly by mechanical means. If the poison has been applied to any external part, as by the bite of a viper or rattle-snake, a cupping-glass, or what will answer as well, a wine-glass, tumbler, or cup of any kind, from which a part of the air has been expelled, by holding within it a lighted candle for a second of time, should be applied immediately.

If poison has been taken into the stomach, and is not of a kind to arrest instantly the action of the heart, its removal is to be attempted by the stomach-pump, or by exciting vomiting. The stomach-pump cannot well be used without introducing into the stomach a considerable quantity of water which, by diluting the poison, les-

sens its violence, in all cases, except that of oxalic acid. But should a stomach-pump not be at hand, we must attempt to produce vomiting by every means in our power. For this purpose, a tablespoonful of flour of mustard, which is mostly to be found in every house, may be put into a tumbler of warm water, and given to the patient; or twenty grains of sulphate of zinc, (white vitriol) dissolved in a pint of warm water, and the disposition to vomit encouraged by tickling the throat with a feather, and pressing on the pit of the stomach. Neither ipecac, nor tartar emetic should be given, as their action is always preceded by much nausea, during which the absorption of the poison is often facilitated.

When the poison is of a corrosive or irritant nature, instead of losing time in seeking the means of causing vomiting, it is in general advisable to adopt the second rule, and attempt to prevent or limit its local, and thereby its remote effects. To accomplish this we must ascertain what the poisonous substance was from which the patient is suffering, and must also know how it acts, as upon this depends the success of our treatment. The objects we should have in view are either to dilute, and so weaken it; to supply from an external source the particular principle which the poison would abstract from the coats of the stomach; or, by adding something to it, so change its nature as to render it comparatively or altogether harmless, which last will always be effected if we can succeed in forming an insoluble compound. The first may be done by giving plenty of warm water; and when we know the particular poison, if the warm water can be made the vehicle of an antidote, the second or third object will also be insured. Suppose sulphuric acid (oil of vitriol,) has been swallowed; add to the water, chalk, magnesia, soda, saleratus, or soap; the acid will form with these substances purgative salts, and will, by either action on the bowels, assist in lessening the inflammation caused by the poison before its being neutralized. So when sugar of lead (acetate of lead,) is swallowed, by giving Epsom salts (sulphate of magnesia,) we form an insoluble sulphate of lead, which will be discharged by the bowels, operated upon by the magnesia, which has been freed from the sulphuric acid. Corrosive sublimate (bichloride of mercury,) abstracts from the coats of the stomach the albumen which they contain, by which it is converted into proto-chloride, or calomel; now

if, by giving the white of an egg, which is pure albumen, we supply it with the principle which it would otherwise obtain from the coats of the stomach, we shall preserve these entire.

Such means, then, are antidotes, properly speaking; for the means by which the secondary or remote effects are to be combated, deserved rather to be termed counter-poisons. The counter-poisons are of no small value in cases of poisoning by the corrosive or irritant, while they are of the utmost importance in the treatment of the sedative and narcotic poisons. To administer these appropriately, we must know which of the vital organs the poison most speedily affects. When it affects the heart, the symptoms greatly resemble syncope, or fainting, and as such poisons are the most dangerous agents, which act as rapidly as the poisons, are alone to be trusted to; such agents are to be found among the diffusible stimuli, ammonia, or its carbonate, i. e., smelling-saltz, applied to the nostrils, or dissolved in water and taken into the stomach, warm brandy and water, &c. Where it chiefly affects the spinal marrow, there occur spasms and difficulty of breathing; when the brain, there is a partial or complete insensibility, (coma) often with, at first, full pulse, flushed face, and laborious breathing, resembling apoplexy. In such a state of affairs, artificial respiration, with the administration of coffee and vinegar, greatly contribute to save the patient.

ANTIDOTES TO VEGETABLE ALKALOIDS.

In poisoning by opium, salts of morphia, hemlock, aconite, belladonna, strychnin, colchicum, gelsemin, hyosciamin, veratrum, veratrin, etc., take iodine, three grains; iodide of potassium, six grains; water, sixteen ounces. The stomach having been emptied, the mixture is to be given by glassfuls, still encouraging the vomiting; and to be followed (in the case of narcotics) by strong infusion of coffee. Purified animal charcoal absorbs and renders inert the active principles of many vegetable poisons, given in doses of an ounce or more, diffused in warm water. Camphor appears to be an antidote to gelsemin, and may be used where an overdose is given. A tea of sassafras, drank freely, will also destroy the effects produced upon the brain by belladonna and hyosciamus.

ANTIDOTES TO METALLIC POISONS.

The saltz of mercury, copper, and lead, are decomposed by the hydrated proto-sulphuret and per-sulphuret of iron, and the compounds produced are comparatively inert. The antidote for poisoning by arsenic, is the hydrated sesqui-oxide of iron. It may be made by adding carbonate of soda to the muriate of iron. It should be given in the moist state, mixed with water. After being once dried, it loses much of its power.

When given in time, magnesia, and chalk are an antidote for the mineral acids and oxalic acid; albumen (white of egg) for corrosive sublimate and verdigris; bark, for tartar emetic; common salt for lunar caustic. sulphate of soda, or magnesia, for sugar of lead and muriate of baryta; vinegar and oil, for the fixed alkalies. These substances act either by neutralizing the corrosive power of the poison, or by forming with it an insoluble compound.

From what has been said upon this subject, the necessity of an acquaintance with it must be sufficiently clear, not only to insure our doing right, but to prevent us from doing wrong. By administering an ill-timed antidote, we may often hasten the fatal event; as where vinegar is given when opium has been swallowed, before it has been ejected from the stomach, and by throwing tobacco smoke into the bowels of a person apparently drowned, we extinguish the feeble spark of life, which might have sufficed to re-animate him, but for such injudicious interference.

ACIDS.

The antidotes of this class of poisons are alkaline substances, which, by combining with the acids, form neutral bodies. For this purpose carbonate of potassa or soda may be used; also chalk, and magnesia, or its carbonate. These latter antacids are especially indicated, when the injurious influence of *oxalic* or *nitric acid* is to be prevented.

PRUSSIC, OR CYANHYDRIC ACID.

Ammonia, or its carbonate, taken internally, and applied externally; chlorine, cautiously inhaled, or chlorine water given internally, or as an injection; cold effusions to the head and spine; brisk frictions, sinapisms, artificial respiration, &c.

ALKALIES.

For caustic potassa or soda, or their carbonates, or water of ammonia, administer one of the vegetable acids, as vinegar, lemon, or lime juice, or solutions of tartaric or citric acid. The fixed oils, as linseed, olive, and castor, by combining with free alkaline bodies, form soaps, by which their caustic effects are obviated.

IODINE.

As this substance combines with starch, to form the iodide of starch, a very insoluble body, any substance containing fecula should be administered, as common starch, arrow-root, wheat flour, &c. They should be mixed with warm water, by which the solubility of the starch is increased, a matter of some importance.

TARTAR EMETIC.

For this salt, and other preparations of antimony, use astringent infusions, as oil bark, gall-nuts, Peruvian bark, or a solution of tannic acid, which combines with the oxide of antimony to form an insoluble body. The efficacy of astringent substances, in cases of poisoning by this metal, depends upon the tannic acid which they contain.

ARSENIC, OR ARSENIOUS ACID.

Hydrated sesquioxide, or peroxide of iron, should be administered every five or ten minutes, in teaspoonful doses, until relief is obtained. The precipitated carbonate of iron may be used, but it is much inferior to the first-named agent. If the arsenic is in the form of *Fowler's solution*, then copious draughts of lime water should be given.

COPPER.

The poisonous influence of the salts of this metal, as sulphate of copper, or the blue vitriol, verdigris, &c., may be prevented by the timely administration of albumen; white of eggs, beaten up with water, should be freely given; milk may also be employed. When a piece of copper, or an alloy of this metal, has been swallowed, the patient should abstain from the use of vinegar, or any acid body, which, by acting on the copper, would form a poisonous salt.

LEAD.

In order to counteract the injurious effects of the preparations of this metal, as sugar of lead, white lead, litharge, and red lead, sulphate of soda, or sulphate of magnesia, or phosphate of soda may be given for the soluble salts of lead. For the metal, or its insoluble forms, dilute sulphuric acid should be given. The elixir of vitriol answers very well for this purpose.

PHOSPHORUS.

Calcined magnesia should be given in water, which has been boiled, in order to expel the atmospheric air from it.

MERCURIAL COMPOUNDS.

For poisoning from the various mercurial compounds, gluten, albumen, sulphur, vegetable charcoal, and stillingia, should be given. Among the most potent of these, where there is slow mercurial poisoning, is the large and copious use of gluten. This may be prepared by straining flour through thick muslin, and boiling the water.

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